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MacUser

50 BEST CD-ROMs

All You Need to Know Before You Buy Office, Home, Kids', or Fun CDs

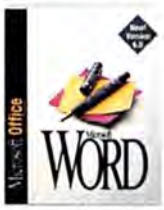


PLUS

Upgrade Your Mac IIci to a Power Mac

Gig-Drive Bargains For 50¢ a Megabyte

New Microsoft Office 4.2 for Macintosh and Power Macintosh includes new versions of Microsoft Excel, Word, PowerPoint and a Mail workstation license.







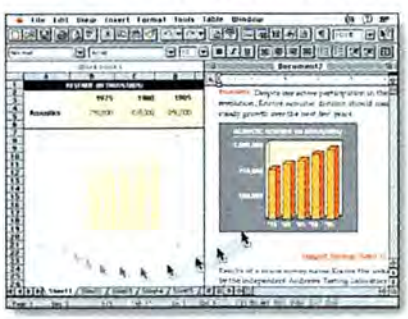


WOULD YOU SETTLE FO

New Microsoft Office 4.2

Granted, everything in your life may not always come together. But on your Macintosh®, it's another story. Because now there's a family of leading, full-featured programs for the Mac® that truly work together like one.

New Microsoft® Office 4.2.



It's never been this easy to move data between programs. All you do is drag and drop.

Think of Office as programs that look alike. Programs that act alike. Programs with links between them. And finally, think of Office as programs that work so closely together, you'll feel like you're using just one.

But experience is the best teacher. So prepare a monthly report to your boss. You'll begin, of course, with Microsoft Word, our intuitive word processor.

And if you make a common typo along the way, don't worry. Word can fix it automatically, thanks to IntelliSense™ technology. It senses what you want to do, then helps you do it. Making everyday tasks automatic and complex jobs a lot easier.

Back to your report. Let's say you're making a point about sales growth. Why not add a sales chart from Microsoft Excel? Simply drag the chart into Word and let go. It's that easy.

You can even make changes to the chart, right where you are. Click on the chart and instantly all your spreadsheet tools appear. Without leaving Word.

Talk about being connected.

But wait, you forgot you have a big presentation tomorrow morning. No problem. You're

Teh→The

Now you see it. Now you don't. Set AutoCorrect to instantly fix your common typos.

at one with your Mac. Just click a button in Word and automatically turn your document into a persuasive presentation in PowerPoint.®

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Because as we just pointed out, IntelliSense technology lends you a hand. Whether you need a quick tip in Microsoft Excel. Step-by-step assistance as you build a newsletter in Word. Or help putting together a PowerPoint presentation.

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And since Microsoft Office supports System 7™ technologies, including PowerTalk™ and AppleScript™, you're free to commune with all the latest Macintosh innovations.

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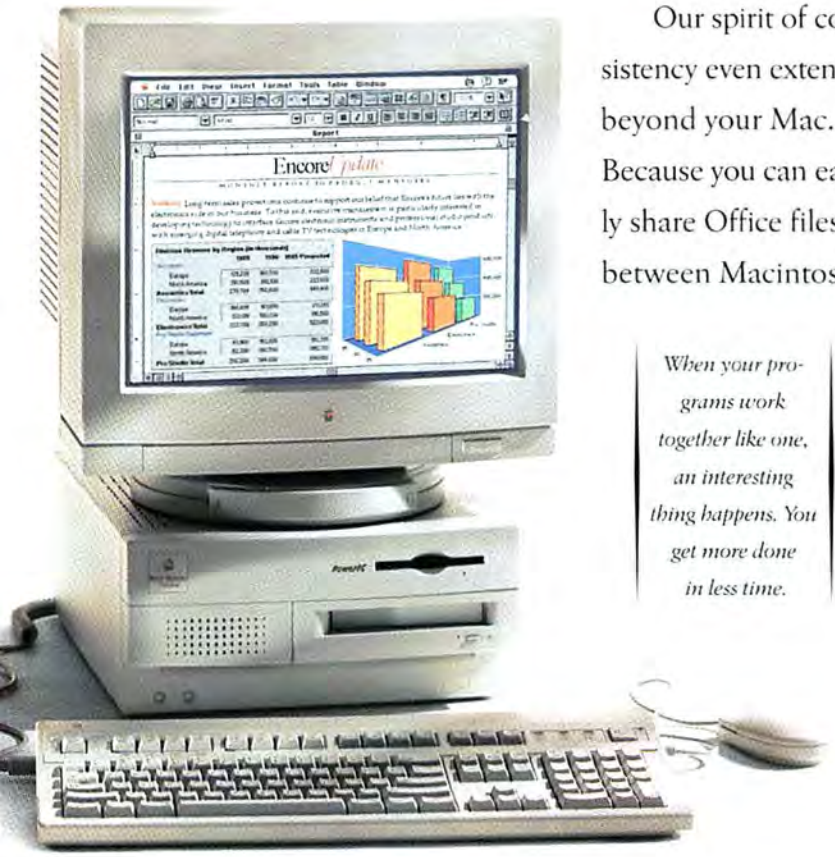


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But first, call (800) 709-3787, Department YP4, to locate the retailer nearest you. They'll help you learn all about the new Microsoft Office Standard 4.2 in versions for both Macintosh and Power Macintosh™.

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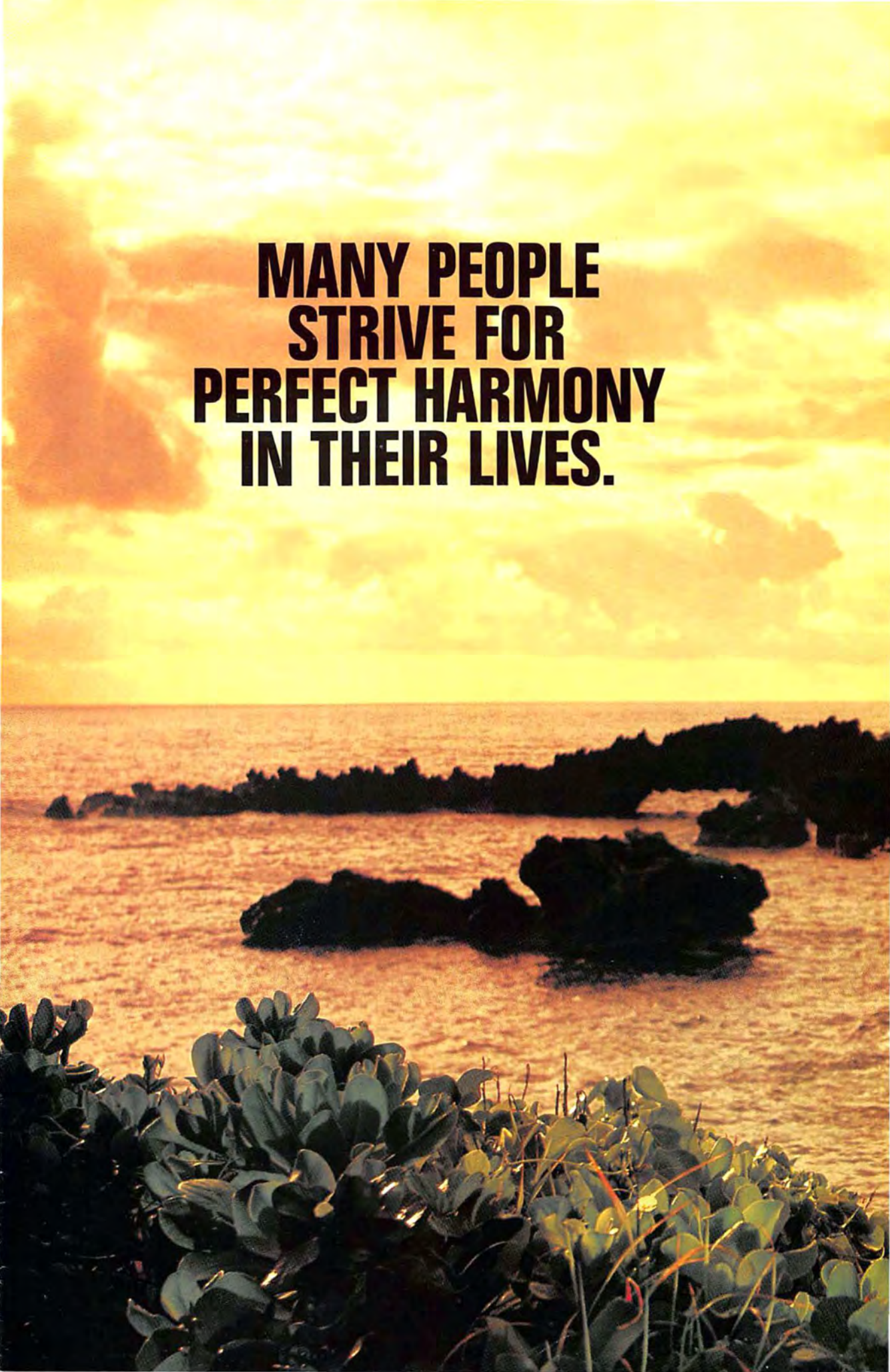
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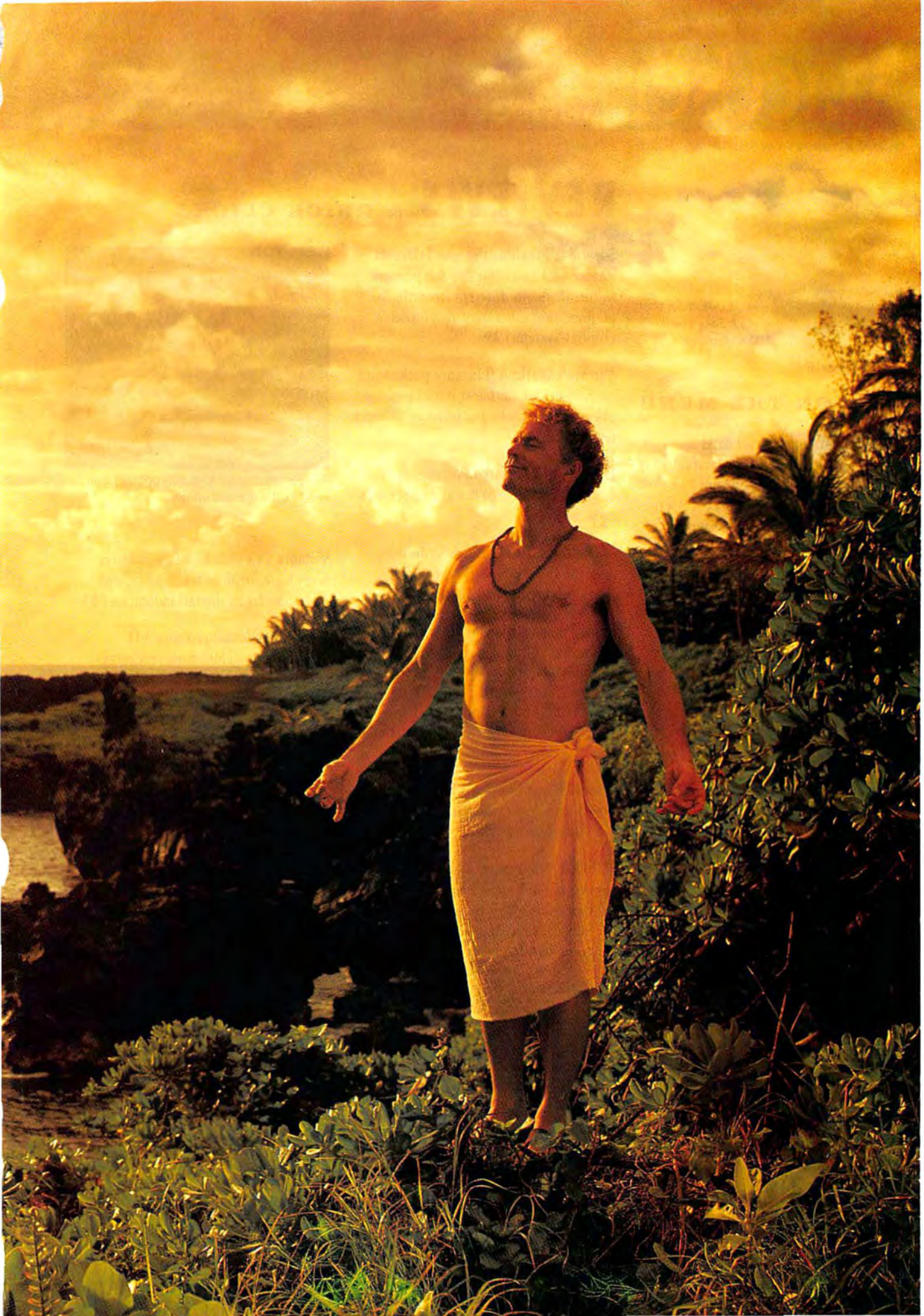


When your programs work together like one, an interesting thing happens. You get more done in less time.

Microsoft Office

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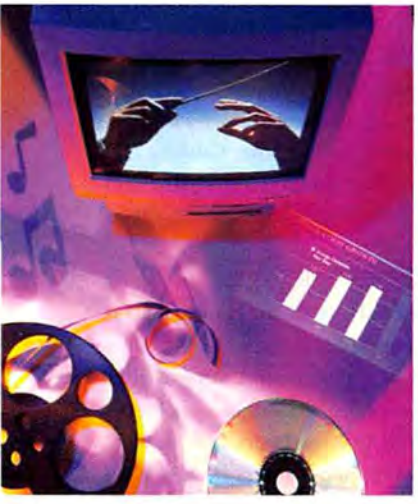
COVER STORY

The 50 Best CD-ROMs



MacUser's annual examination of the state of CD-ROM art.

WE'VE COME A LONG WAY, BABY. This year's countdown of the top 50 CD-ROMs includes a few returnees from last year's list. Big improvements in QuickTime, sound, hypertext, and database-search technologies have redefined what it takes to achieve CD-ROM excellence. Check 'em out. BY CAROLYN BICKFORD / **73**



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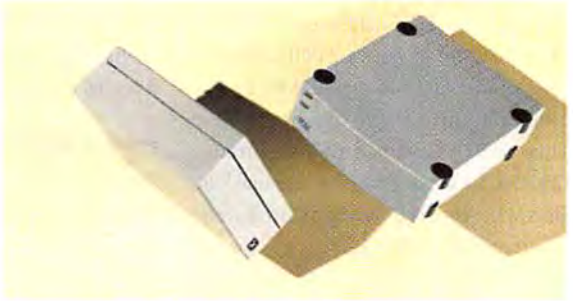
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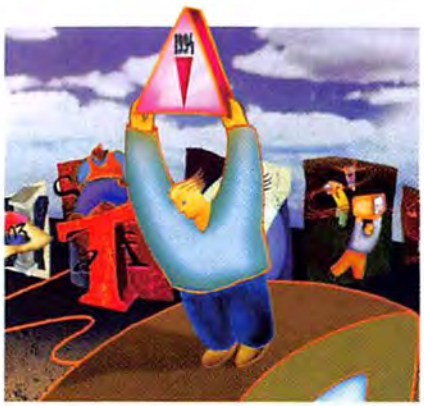
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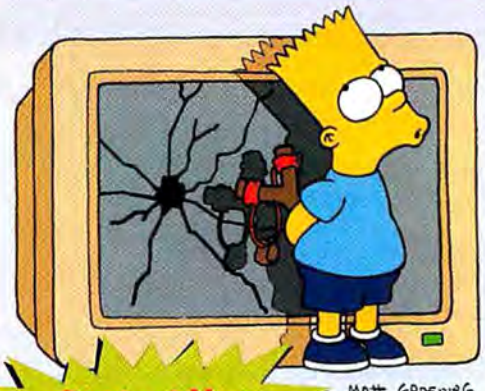
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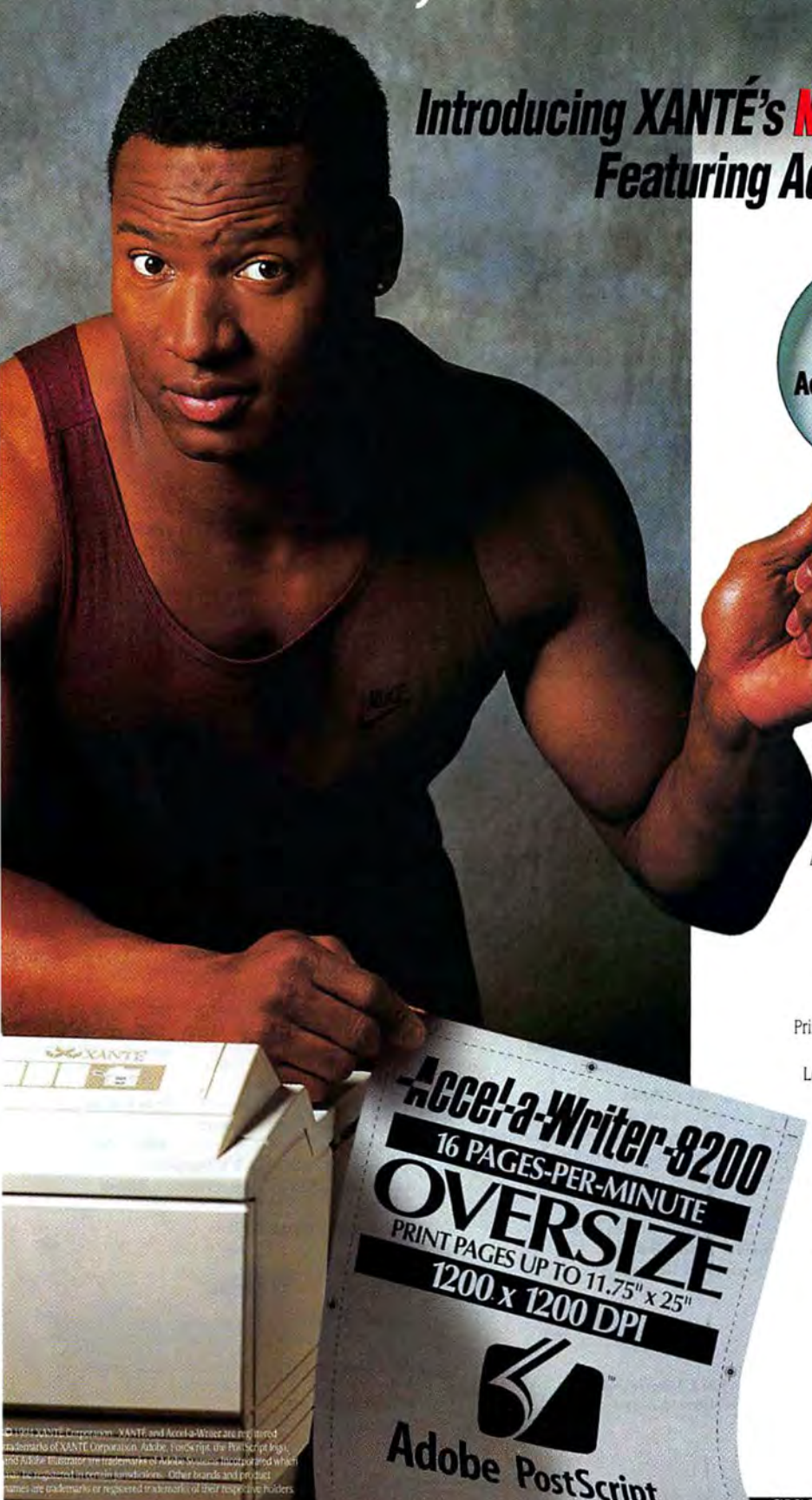
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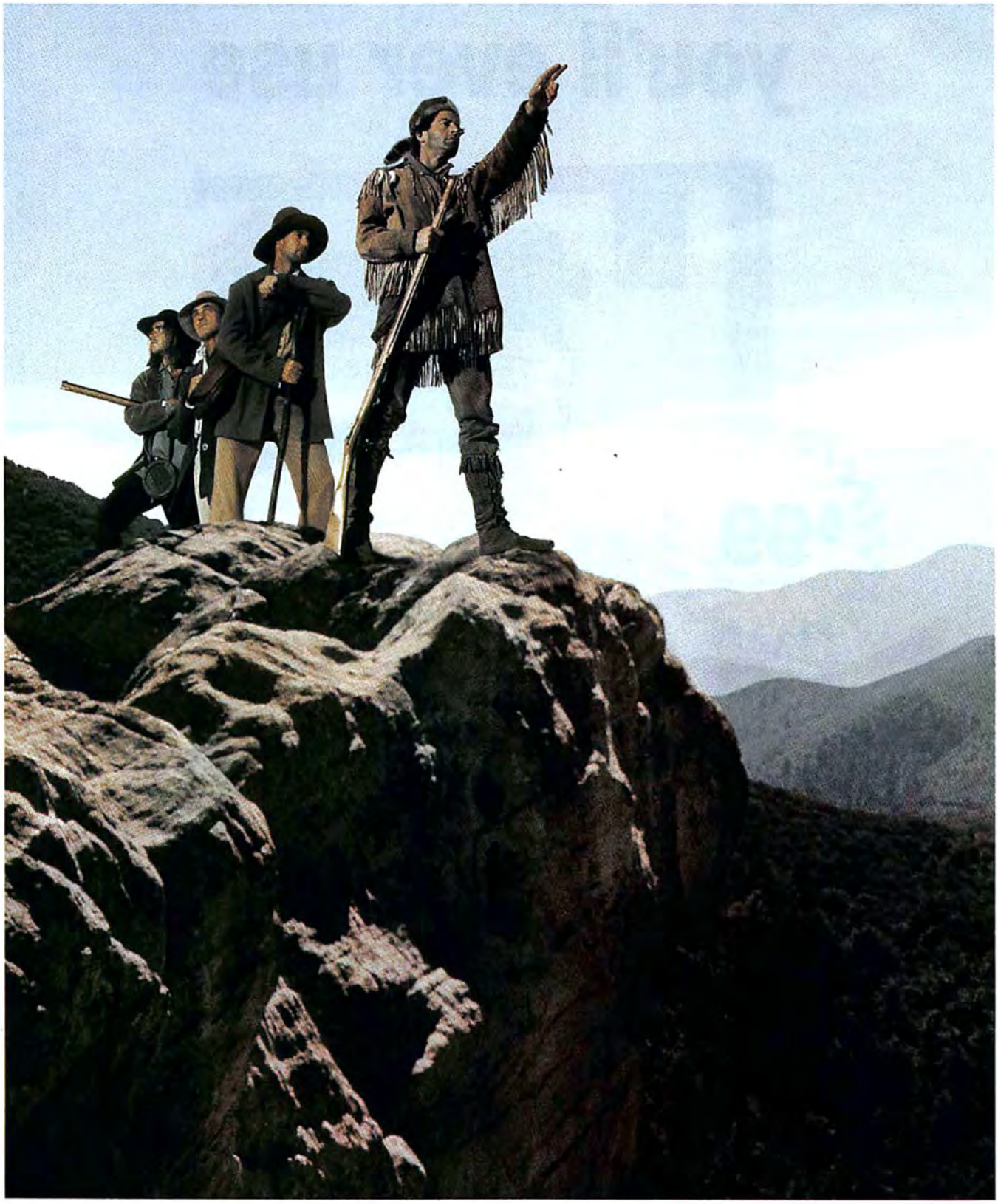
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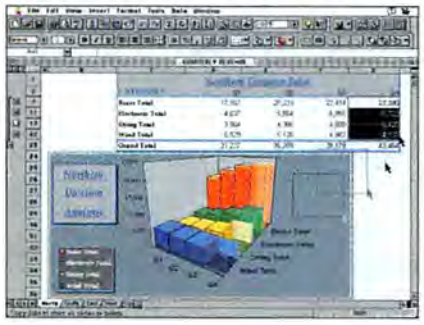
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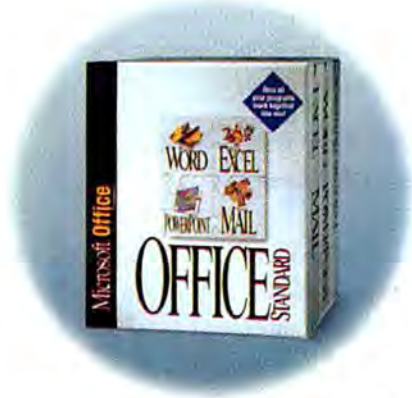
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LETTERS

Choice Advice

THANK YOU for Drew J. Cronk's article "Choosing the Right Mac" (July '94, page 87). Even though I consider myself very knowledgeable about Macs these days and had an idea of what new Mac I was planning to buy, a side-by-side comparison with different user types singled out was invaluable to my selection process.

It turns out I am in the "doodler" category, and the Quadra 650 I was tentatively planning to purchase is now my definite choice. Even though I am single, am no longer a student, and use a PC at work, I still found it interesting to see what is out there for the home, dorm, and office.

Matt Carlin
Ghola@aol.com

THE LOAN for my Mac SE will be paid off in September and I am ready to trade up, so I read "Choosing the Right Mac" with great interest. It supported my decision that my next Mac should be a Power Mac 6100/60 with the 8/250CD configuration. However, I wish you had done a companion piece on the new PowerBooks. I'm left with the dilemma of choosing between the aforementioned Power Mac and the more versatile PowerBook Duo 280c.

Brian K. Donnelly
Manchester, NH

/ We hope you've read "Choosing the Right PowerBook" in our August '94 issue (page 81). / JS

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To send your letter electronically via the Internet, MCI Mail, CompuServe, or ZiffNet/Mac (our on-line service), see "How to Reach Us," on page 4. All letters become the property of *MacUser*, and we reserve the right to edit any letters we print. Include a return address and a daytime phone number. If you write to us on-line, please specify whether you want your electronic address printed.

ILLUSTRATION / JACK MORTENSBAK

I ❤ My Power Mac

THANKS FOR KEEPING me up-to-date on the Power Mac. I took your advice and upgraded from an accelerated vintage 1986 Mac Plus to a Power Mac 6100/60AV. Amazingly, the new machine is compatible with all my existing software and hardware (including SCSI devices). The upgrade has been much easier than the step from System 6 to System 7.

Anyone looking at buying a Power Mac should give strong consideration to the AV option, which offers a very easy solution to the problem of getting video and pictures into and out of the computer.

All in all, I'm very pleased with my Power Mac and will continue to read *MacUser* to get the most out of it.

Paul Morris
72610.401@compuserve.com

High-Tech Nostalgia

ATTACHED YOU'LL FIND a page from my old Xerox 860 instruction manual that may interest you. I guess the patents have run out, or maybe the shape is the only change necessary to make the Apple "high tech" version patentable, but the trackpad idea was out there working 14 or 15 years ago. It's déjà vu all over again!

Baron Whatley
Chicago, IL

/ Mr. Whatley sent along a 1980-vintage manual page featuring a drawing of a keyboard sporting a circular pad on its far-right side. The manual states that the pad is "activated by the touch of your fingers and is used to move the cursor around on the screen. The cursor moves in the same direction that your fingers do on the pad." Yes, but did the Xerox 860 have smart batteries? / JS

Animated Discourse

WE ARE CONCERNED about the Quick Clicks review of our product Animation Master (July '94, page 72). Author David Biedny chose to attack our software rather than review it. Animation Master is a complicated product designed for a complicated process, namely making 3-D animation with organically modeled objects and characters. Clearly, David Biedny lacks both the



OPEN FOLDER

Our far-flung correspondents cover the globe, bringing us Mac news as it happens. This month, new subscriber and IIsi owner Sergio Steinberg, of Buenos Aires, Argentina, asked us to provide a Baedeker for his Finder errors. But we were captivated by his civic pride: "What I can say about my country is a lot, but I promise to send you some pictures soon by mail. If some user wants to contact me to know about my country, give him my address." We can see it now: a group of Mac users riding across the Pampas, carrying only some grub and their trusty PowerBooks strapped across their saddle horns.

The smell of baguettes and taste of wine waft our way in the form of an Internet message from Michel Dumais, of Montreal, Quebec, Canada. The letter contained one sentence of explanation followed by four pages of a news story about QuarkXPress, written entirely in French. Next month: *Microsoft über Alles.*

No dictionary can decipher all foreign tongues, as we discovered in a letter from Terry Easton, of San Carlos, California. Terry's 11-page treatise (complete with wolf-in-sheep's-clothing letterhead), a complaint about Delrina's FaxPRO software, was written entirely in dialect. A sample: "So's we re'nstall the whole FaxPRO . . . and all of a sudden, we're fixin' to fax ya'! An we I doin' it agin'!" Our team of translation experts managed to trace Terry's accent to a strain of Esperanto called Desperato, found only in Silicon Valley.

A more common American dialect appeared from Andrew Reimisch, of Yuma, Arizona, who likened Bill Gates to Beavis while giving us his best Butt-head impression: "Huh, huh, huh, that was dumb!" Ah, it's good to be home.

ASK DR. POWER MAC

WITH ALL THE EXCITING NEWS about the PowerPC chip and Power Macs coming into the marketplace, I wonder how this new technology will impact future PowerBooks. Does Apple have a plan for making its notebooks truly more powerful? Is there a PowerPC chip in store for portable Macs?

Michael G. Walker
Thorne Bay, AK

/ The PowerPC 601 chip in the 6100, 7100, and 8100 is the first of four PowerPC chips IBM and Motorola plan to produce. The PowerPC 603, designed for low-cost and low-power systems, is expected to be the chip of choice for PowerPC-based PowerBooks. Although these machines are generally expected sometime next year, Apple hasn't yet announced any specific product plans; it has said, however, that many current PowerBook models can be upgraded with PowerPC-based daughtercards.

YOU MENTION in your article on the new PowerBooks ("All-New PowerBooks," July '94, page 78) that PowerPC upgrades have been announced for the Duo 250, 270c, 280, and 280c, but Apple's fax info sheets on the 250 mention no such upgradability and a call to Apple's technical-support line confirmed that the company has no such upgrade. Is this a third-party upgrade?

Sam Neal
sjn1@cornell.edu

/ Apple has announced that the Duo models you mentioned will be upgradable to PowerPC in the future, but it hasn't yet said *when* those upgrades will be available. Stay tuned.

I AM BOTH WORRIED and incensed. Upcoming versions of Windows will have the best of both the Mac and the Windows worlds. Apple needs to maintain better system software than Microsoft or face possible destruction. Apple's salvation lies in the AV technologies. I have demonstrated these to DOS users, who are now ready to convert. But there is a hitch — I had the impression that all Power Macs would have PlainTalk, but Apple and its dealers tell me PlainTalk is now available only with AV Power Macs. I must now wait for a PlainTalk bundle to be announced or spend money I do not have for an AV Power Mac.

Nathan Roach
Grapevine, TX

/ Chalk this partly up to confusion before the Power Mac release. Although we said all Power Macs would come with PlainTalk ("Power Macs: Full Speed Ahead," May '94, page 76), only AV Power Macs actually ship with the software.

knowledge and the experience in this area of animation necessary to fairly review our product.

He describes only two specifics about the interface, both of which are erroneous. He states, "creating a simple curved line requires you to draw a line with one tool and then drag in a counterintuitive direction with another." Not true. There is only one Add tool. It's a simple click-and-drag operation, covered in our tutorials. He goes on to say, "If you want to change the curvature, you don't get Illustrator-type control handles: You must specify the changes numerically." The curve controls use a tactile mouse control, as does every other function in the modeler.

It is clear that Biedny didn't spend enough time learning the basics of the software before writing his review.

Ken Baer, VP, Macintosh Product Development
Hash, Inc., Vancouver, WA

/ Working at Industrial Light and Magic, I was privileged to be able to see and try both off-the-shelf and custom character-animation software. Simply stated, brute power isn't enough; a decent interface is required for productive work. After reading Animation Master's poor documentation, viewing the relatively more informative tutorial videotapes, and spending significant time with the program, I came to the conclusion that the product is packed with power that's really hard to access. As for curve editing, control is the name of the game. Illustrator set the standard for curve editing, and Animation Master would benefit tremendously from duplicating the functionality found in that program. / DB

X-ray Specs

WE ALL MAKE dumb mistakes. Sharon Zardetto Aker made one in her "Traveling Safe" article (July '94, page 141). She writes: "X rays are a form of light The only time light can hurt your PowerBook is if you get really, really, *really* close to the sun — at which point, you'll be melting too."

To use the word *light* to refer to all electromagnetic radiation and then to use this sloppy definition to prove that X rays are harmless is absurd.

Gamma rays, by Aker's use of the term, are also merely "light." Would she care to step inside the unshielded core of a nuclear reactor, or visit ground zero after an A-bomb has exploded?

Gary McGath
gmcgath@mv.mv.com

IT'S NOT THE X RAYS themselves that damage electronic equipment and storage devices but the magnetic fields required to generate the X rays. Strong magnetic fields can easily destroy *any* information you have on your hard disk, your floppy disks, and even some EPROMS.

Arnie Boyarsky, UCLA Physics Dept.
SuckFish@aol.com

/ I make lots of dumb mistakes, but this isn't one of them. X rays are indeed a form of light, in the same family of electromagnetic radiation as visible light and radio waves. Referring to them as a form of light is a simple way to differentiate them from magnetic fields but does *not* imply that they are harmless. And yes, strong magnetic fields *can* destroy data, but you won't find those kinds of fields in airport-security X-ray machines. / SZA

A Fig for Newton

JOHN C. DVORAK suggests that Apple dump the Newton ("Spindler's List," July '94, page 218). Maybe he should think twice.

The Newton or its progeny will be the key to individual access to the information superhighway. The company that controls this technology will become the General Motors of the information age. If Apple abandoned the Newton now, it would be making a big mistake!

George Martin
Marnet@aol.com

I HAVE A GREAT sense of humor, but I wish you would stop making fun of the Newton. I don't carry my PowerBook anymore, because it's too heavy and is overkill for my needs. The Newton is great — it's my e-mail platform of choice!

If you want to make fun of something, how about Windows?

Barry J. Silver
BJSilver@eworld.com

Dvorak Versus Dullness

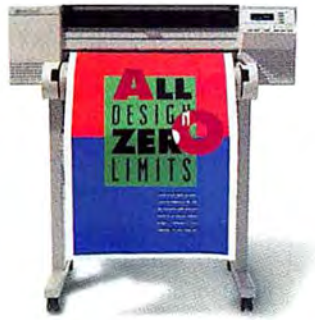
I CAN'T BELIEVE how many Milquetoasts out there complain about John C. Dvorak. Are the masters of dullness trying to force everyone into the status quo of political correctness? He's one of the only remaining originals still in your magazine. He writes the truth (as he sees it, true) — but what's wrong with that? The truth *usually* hurts.

I can't say I agree with him all the time, but so what? I don't want to someday read, "The Dvorak column has been replaced with

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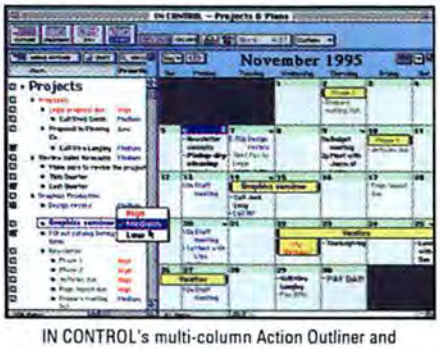
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Rick J. Vogel
73614.1153@compuserve.com

Multilingual Mac

YOUR MAGAZINE would do Apple a favor if you focused on the Mac's superiority over the PC for doing multilingual processing. I recently showed a friend who works at Intel my Mac, which is equipped with the Chinese Language Kit. He was amazed at how I could do both English and Chinese processing without requiring a completely different system than the one provided with every Mac. At that point, my friend conceded that the Mac's system is far better than any on an Intel-based machine.

So why not do an in-depth article on WorldScript technology on the Mac? In future reviews of products, one of the evaluation points should be whether the program is WorldScript-savvy or not. This might put pressure on Microsoft — none of its programs is WorldScript-savvy, and it has no plans to make them so.

Charles Lee
clee@csli.stanford.edu

Menu Mélange

I READ WITH INTEREST the July tip for removing deleted files from a Now Menus submenu (Help Folder, page 146). The solution offered was creative, but a simpler (and documented!) solution does exist: Simply highlight the item in the list, and press the Delete key. A slash will appear through the item, and the next time you enter the submenu, the deleted item will be gone.

Michael Lekas, Technical Services Engineer
Now Software, 71541.170@compuserve.com

By the Side of the Road

NO, ANDY IHNATKO, the information superhighway isn't starting to *seem* more like a toll road ("Dialing for Dollars," July '94, page 19). It always was, and in its infancy it was capable of making money while providing no results at all.

I decided to use CompuServe to do some research for my writing, but CompuServe said my password didn't exist. It sent me another one, but still no luck. Total results: no research achieved, bills over $70.

That's when I unplugged the modem and put it on the shelf, where it lives to this day. Meanwhile, I'm doing fine without the information superhighway. If I'm desperate, I can always drive ten miles to the college and use *its* superhighway.

Marilyn E. Peterson
North Oxford, MA

ANDY IHNATKO'S COLUMN confirmed my thinking about on-line services. I live in the boonies, and it's a long-distance phone call just to connect, plus on-line charges. This makes the costs too high, especially for a retiree on a fixed income. Keep writing thoughtful articles like that one.

Howard M. Heffner
Fairfield, PA

IBM: The Movie

I WAS THE FIRST to buy a 128K Mac when it came out here in Belgium, and today I use a Quadra 650 and a PowerBook. I would almost never use a DOS or Windows machine, but the Mac is dead!

Let's analyze things rationally. The only hardware innovation from Apple since the 128K Mac was more power, and the only system innovation was MultiFinder.

IBM has made a very clever calculation. The Mac has reached its pinnacle, DOS is dead, and Windows is a pale Mac copy. So IBM decided to offer so-called salvation for Apple, but its real intention was to lure the Mac faithful to a new system controlled by IBM.

It succeeded brilliantly. Apple gave IBM and Motorola all its know-how. IBM is coming out with PReP, a platform that will replace the Mac, DOS, and Windows.

Benjamin Muller
Antwerp, Belgium

/ That's an Oliver Stone-class conspiracy theory. I can see the movie now: Brian Dennehy could play Gerstner, and Arnold Schwarzenegger could play Spindler. On second thought, considering the reception Arnold received for his role in *Last Action Hero*, Apple might do better to cast someone with a fresher image. Can you say "Keanu"? / SJS

CORRECTIONS

Our listing for Delrina's Far Side Screen Saver (New on the Menu, August '94, page 32) incorrectly listed the number of modules available in the package. The collection actually contains 14 screen-saver modules.

In the July '94 Help Folder (page 145), the maker of Freedom of Press should have been named as ColorAge.

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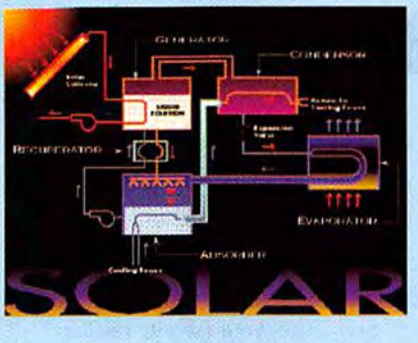
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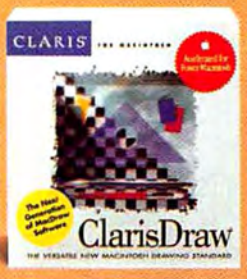






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MAGGIE CANON



Unplugged

"GONE FISHING." I TYPE THESE words into my screen saver, and the message bounces around my screen in slow motion. I look out the window on this, the eve of my summer vacation, and take a mental inventory of my luggage, neatly organized on the bedroom floor. Got the swimsuit, suntan lotion, paperbacks, PowerBook — Hey! Who put *that* in there?

I guess I must have packed it out of sheer habit, after a string of business trips. "Well, just *un*pack it," exclaims the little hedonist voice in my head. "That was the deal, right? A little family time, fresh Lake Tahoe air, natural light, paddling around, sore muscles — there's no PowerBook in this picture." Still, I hesitate.

It's the quintessential modern dilemma, this question of whether vacation should include unplugging from the office. The steady traffic of information from portable computers, beepers, cellular phones, and voice- and e-mail defines the landscape of every business day. After awhile, it's hard to imagine being without it.

So I might as well admit it. In the office and on the road, I'm the reigning queen of e-mail. My in boxes overfloweth, with mail from Lotus Notes, QuickMail, AppleLink, MCI Mail, and a handful of on-line services all crying out to be read. If I let the e-mail lie for even a day, it breeds in the dark of night. By the next morning, yesterday's mail bows under the weight of a spanking new pile of messages. Like a lot of people, I know that if I let the messages pile up for more than a few days, I may never catch up.

Besides, taking your office along with you is so much easier these days. Many's the business-trip evening I've spent in a Las Vegas or Boston hotel room dialing in on Apple Remote Access. I'll take a little after-dinner stroll through my hard disk and server, nab a file to work on, and check and answer my mail. It's quiet, and I get a lot done. And returning voice-mail messages, of course, is a quick process after-hours.

So why not tuck the trusty PowerBook in with the shorts and sandals and dip into the office between dips in the lake? Think of the peace of mind I'd have, knowing that I wasn't paddling while the home office burned! Any glitch or serious puzzlement could be brought to my attention, and I could keep tabs and keep tanning, worry-free.

That rationale works for a lot of people. For a few dollars a day, you can have a fax machine in your beach house in the Yucatan. Luxury hotels in Hawaii will bring laptops and cell phones to you at poolside, on request. (Tell me this hasn't supplanted the standard poolside amenities: one fluffy beach towel and one frozen daiquiri.)

Let's face it, for a lot of people, being seen with all this telecommunications paraphernalia is a matter of status and ego, another way of trying to show how important they are. The reason you need to have the cell phone/beeper/laptop constantly within reach is because *somebody needs you.* And everyone needs to feel needed, right?

But I'll stand fast: I believe that people should unplug occasionally. Give the home office and the people in charge space to solve a few problems on their own. Let go of the question, What loose end did I overlook? or the fear that the folks back home will decide the office runs just fine without you.

Most important, untethering from technology lets you remember who you are without the distraction of the workaday signals that tell you where to be, who to call, and what to do. You wake up on vacation and invent yourself that day. If you're lying on the beach in Maui, watching some local kids nap under the palms, you might just become Gauguin and run away to Tahiti to paint, taking in the colors, the textures, until — rrrrrring! The cell phone, jumping around in the bottom of your beach bag.

I believe in a clear distinction between work and play. Sometimes, the most productive thing you can do is be profoundly idle.

Or maybe you take a hike outside Santa Fe and return to your guest adobe having witnessed a breathtaking desert sunset. In a moment of poetic fervor, you turn on your PowerBook to tap out your impressions. Hmmm — first maybe you ought to check your e-mail, as long as you're here. What's this? A note from the MIS folks: Major server crash, some data irretrievable. Now what was that you were going to write about? Some sunset; it's not important. Exactly *what* data is irretrievable?

See what I mean? There are some advantages to leaving the tech toys at home.

I believe in the benefit of suspending your sense of time and place now and then and letting there be a clear distinction between work and play. Sometimes, the most productive thing you can do is be profoundly idle. Speaking of which, there's a bright yellow raft with my name on it, somewhere on the clear waters of Tahoe. Best way to reach me there? Send a message in a bottle.

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CIRCLE **16** ON READER SERVICE CARD

ANDY IHNATKO



S827 Amortization Concerns

A PRESSING CONCERN FOR THE MIS managers of today is the quarterly dilemma of Schedule C amortization of multiplatform hardware purchases. In the halcyon days before multi-operability, support of UNIX, DOS, Windows, Mac, and VMS operating systems required the purchase of discrete hardware for each. Although the cost was considerable, these expenses could be distributed against the budgets of multiple departments, leading to a huge tax windfall

OK, has the boss gone? You sure? Whew. Sorry about that mumbo jumbo. That's just one of the costs of having the first few lines in big type; I regret the need for duplicity, but it was absolutely essential. After all, how would your bosses react if they saw you reading a column entitled "How to Embezzle a Free Home-Theater System Out of Your Office Budget"? Yes, that's right, this month, as a way to thank *MacUser* readers for their kind support lo these many years, I will outline a foolproof plan for swindling enough dough for a laserdisc player ($500), Dolby Surround processor ($400), and center and surround speakers ($180). To top it all off, you ought to have enough left over for a copy of Pioneer's stunning *Terminator 2: The Special Edition* ($90).

How will you accomplish this wizardry, you ask? Well, the folks at *MacUser* Legal have informed me that I can't post my complete list of Weigert ATM "Wizard" codes, so I'll have to settle for this: When Management hands you a list of big-name software to buy for your workstation, buy less expensive alternatives and pocket the difference. For most people, *alternative* conjures up the image of three-chord Seattle garage bands composed of four guys dressed like Peter Brady. That's a completely trenchant mindset, but it should also start you thinking that the mega-best-selling software packages, although fine products, are often overkill; you can get by nicely using software that has less ambitious feature sets and prices.

Word processing is probably the best example of this sort of mind-set. After all, think about the one humble purpose a word processor serves: to take the data queued up in the biochemically encoded linguistical output buffer of your brain and translate it into nice, useful ASCII codes. That's it; that's 90 percent of the utility of the software right there. The remaining 10 percent is just window dressing to make sure the text is spelled correctly and formatted nicely. Therefore, although I can sincerely say that Microsoft Word ($295 street) is an utterly fantabulous word processor in nearly every way, it's clearly overkill for many people, particularly those who merely want to bang out some form letters or get a report together. Take a gander at MacWrite Pro ($89 street) instead. For $89 (let me say it again: *eighty-nine miserable little dollars*), you get a product with just about every editing and document-formatting feature you can name — all wrapped up in a slick user interface — and the ability to read and write all the popular file formats, including Word's. Criminy, it's even AppleScriptable. Come on, for a hundred bucks, you get all that and have enough left over for a movie. *Including* popcorn and soda.

With Excel ($295 street), Microsoft has The Standard product in another category and quite deservedly so: It's truly a kick-butt spreadsheet program. I say this not because I have encyclopedic knowledge of every spreadsheet program ever published or have spent a lot of time interviewing experts on the subject or have even done any real research. I say this out of pure, abject terror. I mean, look at the size of that box. This is clearly a product that would crush an unsuspecting child if it ever chose to leap down from a high shelf, and as the proud uncle of three, I intend to suck up to Excel with Arsenio-like intensity until all of them hit puberty. Excel's dominance is nigh absolute, and the heads of WingZ and Claris Resolve marketers perched upon pikes around Microsoft's corporate campus offer silent testimony to the difficulty of promoting an alternative.

PROBLEM:

Your boss wants you to blow the budget on software.

SOLUTION:

A new home-theater system.

But a little-known product has managed to survive the Spreadsheet Wars by doing an end run and marketing itself as shareware: William Paar's Mariner. For a $40 shareware fee, you get a spreadsheet program that is absolutely state of the art, although admittedly we're talking state of the art as of 1989 here. Still, it supports comfortably huge spreadsheets; as many math, financial, and statistical functions as you can shake a stick at; many styles of graphs and charts; and even 3-D spreadsheet linking. There are caveats, sure: It's not a full-featured spreadsheet program (no macros, no color, and only plain-text format for importing and exporting data), and because Mariner is a shareware product, its compatibility with future versions of system software is far from assured. But if your

need for a spreadsheet program is modest, Mariner offers considerable bang for the buck. (If you'd prefer traditional commercial software, there's Davidson's $59.95 The Cruncher, although I think its wacky sound effects would give you away immediately.)

In the Drawing and Digital-Image Creation, Manipulation, and Compositing (in other words, graphics) category: Well, Adobe has this one dang-near locked up with Illustrator ($385 street) and Photoshop ($549 street). Aldus FreeHand ($390 street) is just as nice as Illustrator to some, of course, but the cost savings ain't gonna get us much closer to that home theater. The problem of finding another alternative to Photoshop is that, well, there really is no other *direct* alternative. But if I allow myself to break a little rule I silently set for myself and toss multiple-function applications into the pot (a rule that prevented me from recommending ClarisWorks as a single spreadsheet and word-processing solution), then I have no qualms about mentioning Deneba's grotesquely underrated and underpriced artWORKS ($99 street). It's not terribly elegant, and its speed is less than spectacular on low-end Macs, but nonetheless Deneba has managed to successfully combine the most-popular and -useful parts of Illustrator and Photoshop into one cheap piece of software. As a draw program, it offers PICT-graphics creation and PostScript; can create full Bézier curves, along with tricky fills, gradients, and limited text effects; and can read and write old-style Illustrator 88 files. As a paint program, it supports 24-bit color, resolutions as high as 2,400 dpi, and pressure-sensitive graphics tablets, and it offers advanced masking features that are reminiscent of Photoshop channels, although they're not nearly so robust. On top of this, artWORKS supports Photoshop plug-ins, which means that if your coworkers are scanning a photo directly into Photoshop and then setting the image on fire with Kai's Power Tools, you can do the same with artWORKS. In theory.

So there you are; you've just made off with more than $1,170, enough for all that home-theater gear *plus* the special edition of *The Abyss,* with no appreciable loss in software functionality. Of course, all these recommendations are just my own personal opinions; you're welcome to say that I'm a bonehead and completely out of touch with reality, so long as you don't mind the possibility that I might call you Mom out of sheer reflex. But the point is that the fourth-easiest way to waste money in this business is just to buy software by rote. Although I'm a firm believer in sparing no expense for those critical day-to-day tools, I believe just as firmly that you should never buy a product until you've researched and conclusively dismissed at least two others — uh-oh.

Form 91: Your Friend

So in conclusion, let me say that that although it's essential to keep properly certified CPAs on retainer, the value of a deep knowledge of Form 91, Form 82A, and the quarterly Code Addendae Specularum will be seen on every monthly balance sheet.

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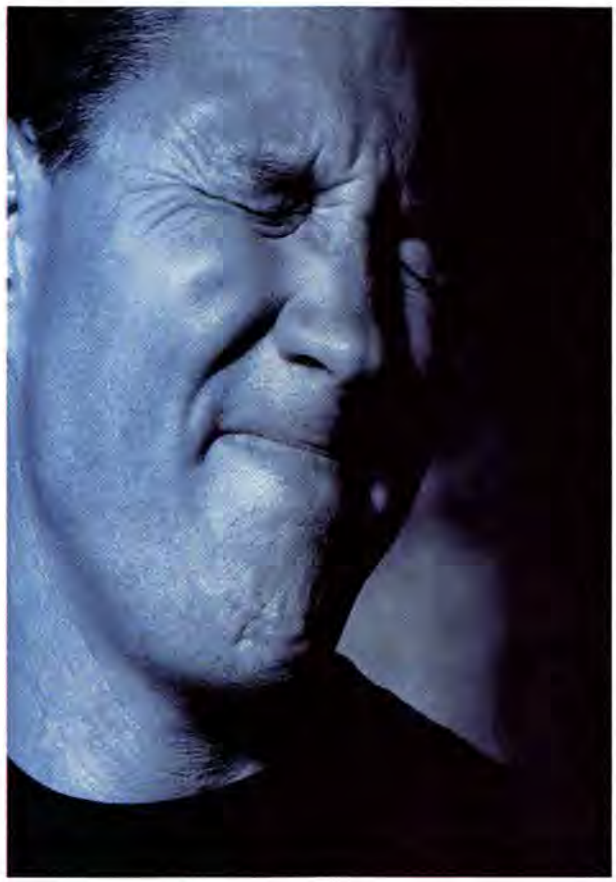


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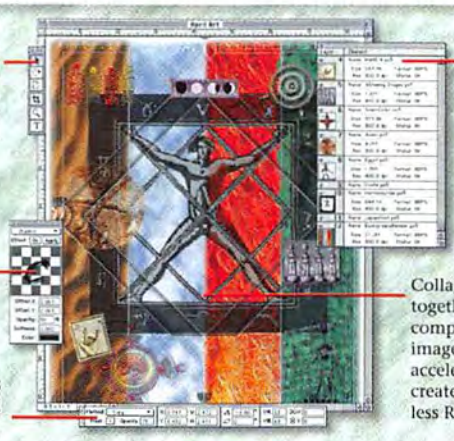
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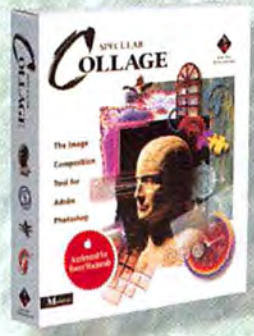
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CIRCLE 57 ON READER SERVICE CARD

Code: AT002

MICHAEL SWAINE



An eWorld Ride

EWORLD IS APPLE'S BRAND-NEW on-line service, and now that I've spent a few months there, I feel like I've been to a theme park. That is, I feel like I've been taken for a ride.

Being taken for a ride isn't always bad. Some of you may remember a time when gas was cheap and going for a ride was considered family entertainment. You may recognize it even if you don't remember it firsthand, since it's been immortalized in a whole series of bad movies starring Chevy Chase.

There's your typical American family; let's call them the Albert Gores of Tennessee. After some slapstick involving Dad and a skateboard in the driveway, the Gores pile into the family Oldsmobile and head out on Interstate 40 into the Tennessee countryside. Mom and Dad point out the educational sights, while every so often, in the back seat, young Al Junior pauses in his game of license-plate spotting to marvel aloud at the efficiency of the interstate highway system.

An idyllic vision, to be sure.

But it couldn't last. Nobody was making a buck on this "going for a ride" stuff. Clearly what the American family needed was *someplace to go.* And somebody to take their money when they got there. Thus the shopping center, the suburban mall, McDonald's, Disneyland.

Families now cruise the Internet for entertainment, with Mom and Dad pointing out the educational sights and the kids looking for games or making a game of the ride itself. Of course, what they really need are new, colorful, expensive places to go. Apple decided to supply that need and build its own little Disneyland.

In some ways, it came pretty close.

Disney and Apple have each earned reputations for quality, and there is nothing second-rate about eWorld. The user interface is so attractive and easy to use that it could attract people who were never interested in on-line services before.

And eWorld is entertaining. Discussions are lively. Subscribers can download clips from current movies such as *Forrest Gump,* book airline flights, play games on-line with other subscribers, read electronic versions of magazines and reference books, and attend electronic conferences.

Is Apple worried about culture clash, fearing that Windows users will reject eWorld's culture?

Some on-line services have better tools than eWorld's for navigating through messages, but eWorld's is not so much bad as different — although for on-line veterans, that's probably the same thing. The Internet gateway on eWorld is easy to use, and eWorld provides a lot of on-line help in sending messages.

The perception that eWorld is expensive is generally true, but the pricing issue is complicated. Unlike CompuServe, eWorld does not charge for Internet messages sent or received and does not charge extra for a 9,600-bps connection.

Where's Windows?

But eWorld does have some fairly disturbing limitations.

There's no Windows version yet. Is Apple worried about culture clash, fearing that Windows users will reject eWorld's culture, as French Yankeephobes and Virginia historiphiles have rebelled against Disneyfication in their respective bailiwicks? Or maybe it's just that well-known lack of competent Windows programmers in Cupertino. Not that there's any content on eWorld that would be of particular interest to Windows users.

Then there are the Newton interface and the support for using AppleScript to hook eWorld facilities to other applications. Or rather, the lack of either.

eWorld's Internet gateway is excellent as far as it goes, but it only goes as far as e-mail. There's no support for file transfer or any of the Internet search tools that net surfers can't do without. These are all "coming soon."

Then there's another kind of limitation. Ads for Six Flags theme parks talk about them being "cleaner than reality," and eWorld is just as well scrubbed, with official don't-call-them-censors policing discussion content.

Some people complain about eWorld's pricing and message threading, and Apple may need to revisit its decisions in these areas. But I think Apple made a more serious error when it limited access to eWorld and limited access from eWorld to the rest of the electronic universe.

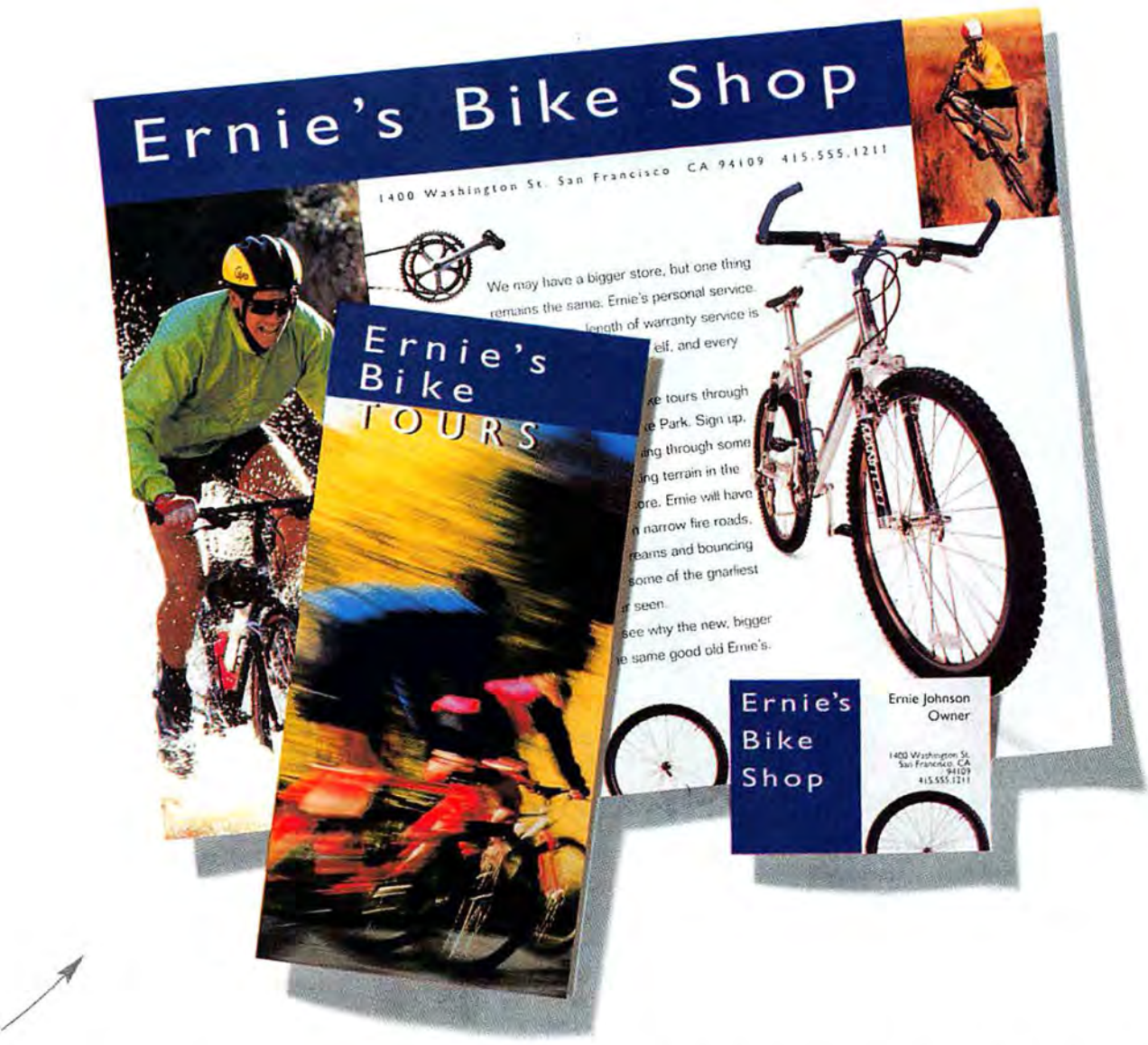
The launch of eWorld is history now. Apple will never have another such opportunity to plant in people's minds what eWorld is. No doubt the Windows interface and the rich Internet access are coming. But they could have been part of the definition. Instead, eWorld has been defined in the public mind as a proprietary, Apple-centered, limited service. If that's what Apple wants, I offer it a slogan: "eWorld: It's a small world after all."

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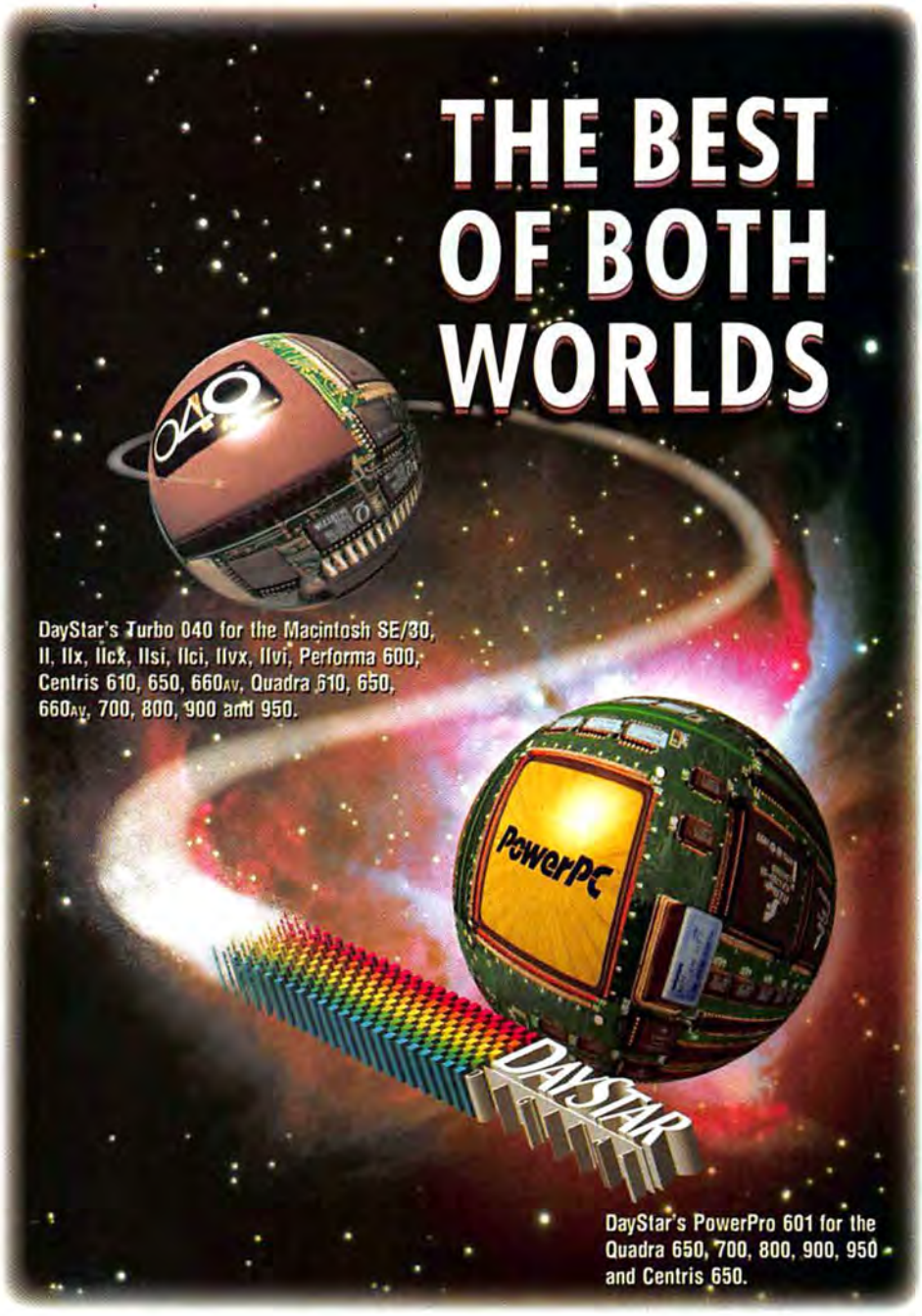
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MAC HOME JOURNAL September, 1994

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New versions of client/server database products run on multiple platforms — including Power Macs.

THE RAP ON ACI US' 4th Dimension and 4D Server database products has been that their Mac-only approach limits their potential in today's multi-operating-system environments. ACI intends to change that with 4D Universal, new versions of its database and server software that will run on Macs (680x0 and PowerPC), Windows machines, and UNIX workstations. In addition, the company planned to ship a native PowerPC version of 4D in September.

4D Universal. According to ACI, 4D Universal products are designed to be platform-independent, targeting the features of specific platforms, as opposed to cross-platform, which means that one platform's features are merely ported to another's. Written in C++, 4D Universal products achieve a platform-independent architecture with what ACI calls the virtual-machine engine, which comprises an engine plus platform adapters that supply the code needed to make the software run on each of the various computers 4D Universal products support.

First in the new line is 4D Server Universal. A redesigned version of the Mac-based 4D Server along with Windows and Sun Solaris implementations of the software are due from ACI by the end of the year. Versions for Windows NT and IBM and HP UNIX platforms will follow, as will 4D development environments for these platforms. UNIX servers will run under IBM's PowerOpen.



ILLUSTRATION / JOHN RITTER

The Universal version of the 4D database software, designed to work with 4D Server Universal, is slated for release in 1995. However, databases created with current versions of 4D will be compatible with 4D Server Universal through a supplied converter. Pricing for the 4D Universal products has not been announced.

4D Native. While you wait for the bells and whistles of 4D Universal, you can content yourself with the first native PowerPC versions of ACI's current suite of database products, including 4D ($895), 4D Server ($1,195), and 4D First ($99). The native applications have no new features, but upgrades from 680x0 versions are free. PowerPC and 680x0 versions of the ACI products will ship in separate packaging. 4D Compiler ($1,000) is also shipping; it produces fat-binary code that allows 4D database programs to run on 680x0 and PowerPC Macs.

Hoping to add some punch to its line of Workgroup Servers, Apple has begun bundling 4D Server with some configurations of its 8150 and 9150 PowerPC Workgroup Servers. Pricing for the servers was not available at press time. 800-384-0010 or 408-252-4444. / Shelly Brisbin

E-MAIL /

Eudora Conquers Mac Internet Connections

THE ALLURE OF INTERNET connectivity — especially the near-instantaneous speed of Internet mail — can be pretty strong. Although a few all-in-one Internet packages also handle mail, Qualcomm's Eudora has conquered the Mac Internet mail universe by offering an easy interface. With the addition of several new features in version 2.1, Eudora ($65) seems poised to tackle interoffice as well as Internet e-mail.



In addition to running native on Power Macs, the new version of Eudora brings refined, easier-to-use features to the table. The mailbox window has been revamped — users can now sort all messages by clicking at the top of the mailbox window. To aid in navigating large mailboxes, you can assign color-coded labels (the same ones the Finder uses) to individual messages, either manually or through Eudora's rules-based message filtering.

Eudora 2.1 also simplifies the often arcane method Internet mail uses to time-stamp messages. Now messages can be displayed in terms of local time, which means that users can avoid the complications of adding time-zone modifiers to mail. Transferring messages between mailboxes is now as simple as dragging them out of one mailbox window and into another.

As always, Eudora requires a mail server supporting POP (Post Office Protocol) and SMTP (Simple Mail Transfer Protocol) as well as a connection to an Internet service provider.

For $99, users can purchase Eudora with Working Software's Spellswell 7 spelling checker, which works seamlessly with Eudora via Apple events.

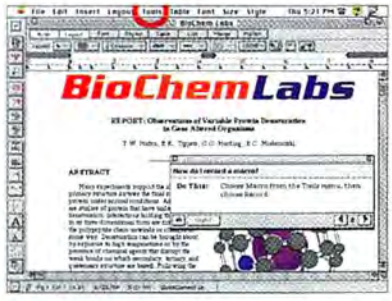
As more companies plug in to the Internet, Eudora's easy e-mail access coupled with features such as message filtering, a refined interface, and an optional spelling checker could bring it out of the hacker closet and into the corporate mainstream. 800-338-3672 or 619-587-1121. / Jason Snell

BUSINESS TOOLS /

WORDPERFECT FORGES AHEAD

New releases showcase intelligent assistance and support for new Apple technologies.

NOT CONTENT TO REST on its laurels as the first company to provide a native PowerPC word processor, WordPerfect — a.k.a. the Novell Applications Group — is revving its Mac word processor yet again, with a 3.1 release that may beat Microsoft's long-awaited PowerPC version of Word 6 to market. With its QuickCorrect feature, Apple Guide help, and support for other System 7.5 features, WordPerfect 3.1 ($495; upgrade, $89) counters some of the IntelliSense features in Word 6 and provides fresh evidence of the company's commitment to supporting new Apple technologies.



To coach you step by step through tasks such as macro recording, WordPerfect 3.1's help system uses Apple Guide, System 7.5's interactive-help capability.

Help When You Need It. Like similar new features in Word 6, WordPerfect 3.1's QuickCorrect feature automatically corrects mistyped or misspelled words, expands abbreviations, and fixes various capitalization errors—on the fly. WordPerfect 3.1 can't automatically format a document, which Word 6 can, and it doesn't have Tool Tips or Wizards — but it *does* use System 7.5's snazzy new Apple Guide feature to interactively teach you how to perform tasks, step by step. A streamlined procedure for importing and merging delimited text should make this awkward task easier as well.

Advanced Technology Support. In addition to Apple Guide, WordPerfect 3.1 supports a wide range of System 7.5 features: QuickDraw GX printing, Macintosh Drag and Drop, PowerTalk, Macintosh Easy Open, and AppleScript. It also offers easy installation over a network by installing the appropriate version for PowerPC and 680x0 Macs.

Companywide Software Trends. Other WordPerfect summer releases reinforce the current trends toward greater linguistic intelligence and network-related improvements. Version 6 of the grammar checker Grammatik ($49.95) not only finds grammar errors but also offers impressively sophisticated rewritten sentences that you can click on to accept. And Novell GroupWise 4.1 (formerly named WordPerfect Office) provides enhanced client support to that e-mail, calendaring, scheduling, and task-management application; its most gee-whiz new feature is a text-to-speech converter that lets remote users dial in to hear items such as e-mail and calendar schedules over the phone (five-license pack, $695; higher-volume licenses also available).

Given WordPerfect's involvement in OpenDoc, you can expect another future trend to be small applications focused on particular tasks. With a full install of WordPerfect 3.1 taking up 8 to 10 MB — compared to approximately 22 MB for Word 6 — it looks as if WordPerfect has a head start in that direction. 800-451-5151 or 801-225-5000. / Karen J. Ohlson

Microsoft Works CD-ROM Adds Multimedia

ONE-BUTTON ACCESS to Bookshelf is just one of the neat features of Microsoft Works 4.0, but it doesn't mean much if you don't have the Bookshelf disc. With Microsoft Works 4.0 Multimedia Edition on CD-ROM, you get it all.

The multimedia version includes everything in the standard Works package (see New on the Menu, September '94, page 29) plus more than 1,100 clip-art images, 20 QuickTime clips, extra templates, and animated how-to tutorials. In addition, the Multimedia Edition CD-ROM contains the contents of the $64.95 Microsoft Bookshelf CD-ROM (including a dictionary, a thesaurus, an encyclopedia, and other reference works).

The multimedia CD-ROM has a suggested price of $99.95, the same price as the standard floppy-disk-based Works 4.0. If you've just bought Works 4.0, you can get the CD-ROM for $15. 206-882-8080. / Jason Snell

MACUSER/ZMAC UTILITY OF THE MONTH

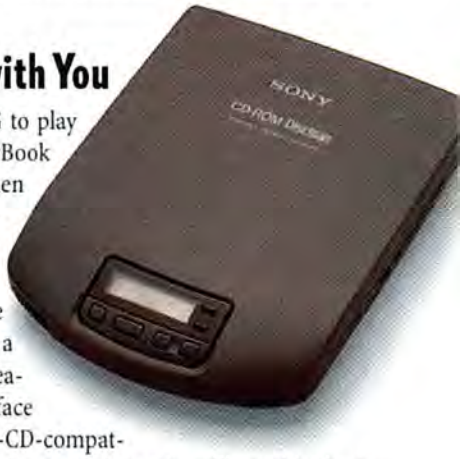
More Power to You

THIS MONTH'S ZMac Utility, PowerPeek, allows Power Mac users to see exactly how much power they're getting from their Mac. The PowerPeek extension reports on other system extensions and control panels that are putting the brakes on your system and scans your hard disk for applications that contain native PowerPC code. It also puts an indicator light on-screen that shows you at a glance whether you're running native PowerPC code or idling along in the slower emulation mode. See for yourself where the performance bottlenecks lie.

Created by Bill Hofmann, of Fresh Software, PowerPeek is available exclusively from the ZiffNet/Mac service on CompuServe (GO ZMC:MACUSER), ZiffNet Selections on AppleLink, and ZiffNet/Mac services on eWorld (Shortcut: MacUser). / Mark Simmons

CD-ROM /

You Can Take It with You



EVER GET A HANKERING to play Myst while off on a PowerBook trek in the wilderness? Then Sony's new CD-ROM Discman ($130) might be right up your alley. This double-speed drive, with all the audio-CD functionality of a standard audio Discman, features a PCMCIA-card interface and is multisession-Photo-CD-compatible. Sony says alkaline or rechargeable batteries will provide about two hours of life. 800-352-7669 or 408-432-0190. / JS

HOUDINI ESCAPES AGAIN

Apple shows speedy DOS card for Power Macs.

THE BLUE CROWD got its first look at a forthcoming DOS Compatibility Card for the Power Macintosh during an Apple technology demonstration in late June. Like its predecessor, the short-lived DOS Compatibility Card for the Quadra 610, which was code-named Houdini, the new card enables Mac users to run DOS and Windows applications on a true Intel 486 processor.



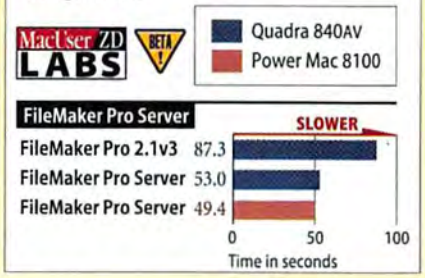
ILLUSTRATION / JOHN RITTER

Emphasizing that it was not announcing a product, Apple declined to elaborate on which Power Mac model would support the new card. The prototype card uses a 50-MHz 486DX2 microprocessor, which provides double the performance of the 25-MHz 486SX-based DOS Compatibility Card for the Quadra 610. Apple's demonstration did address two other areas of customer concern: networking and support for Creative Lab's SoundBlaster — both of which were seriously lacking in the Quadra version of the card. These two improvements should make this next-generation Houdini more attractive to both corporate sites and home users.

The DOS Compatibility Card for Power Macintosh will have to compete with Insignia's SoftWindows, which provides 286 emulation in software — and which ships with some Power Macs — and Orange Micro's OrangePC Series 200 NuBus cards, which contain 486 processors. / Sean J. Safreed

Power Mac Time Trials

THE SERVER COMPONENT of Claris' FileMaker Pro has been designed to eliminate some of the bottlenecks of FileMaker Pro. Given FileMaker Pro's need for speed, we wanted to see how much faster you could work with FileMaker Pro Server in native mode. We ran a 3-MB FileMaker Pro file on a Quadra 840AV with on-board video running in 8-bit mode and on a Power Mac 8100 with its VRAM running in 8-bit mode. Each machine had 16 MB of RAM, a 1-GB Apple hard drive, and a 16-inch Apple monitor. All tests were conducted using ten clients accessing the same file. FileMaker Pro Server running native on the Power Mac was 77-percent faster than FileMaker Pro 2.1v3 on an 840AV. But it was only about 7-percent faster than FileMaker Pro Server on the 840AV. Because certain parts of System 7 are running emulated, the Power Mac does not perform as well running native FileMaker Pro Server as it might. / SJS



Prices of PowerPC 601 Chips Plummet

TRYING TO MAKE GOOD on its promise to deliver the same performance at half the price of Intel's Pentium chips, IBM recently announced lower prices on current PowerPC 601 processors and aggressive pricing for upcoming PowerPC 603 chips.

In quantities of 1,000, the 66-MHz 601 chip lists for $257 each, down from $293; the cost of the 80-MHz version has been slashed by 20 percent, from $450 to $360. The cuts put the price of the 80-MHz 601 at about half that of Intel's 90-MHz Pentium, which offers comparable integer performance at a price of $707 (also in quantities of 1,000).

Chip prices represent only a fraction of overall system costs, however, and Apple does not necessarily pay list prices for its PowerPC chips.

Whether IBM's new chip pricing will translate into lower system costs — which would in turn spur sales — was unclear at press time. Aggressive competition for Intel-chip-based PCs has pushed prices for 90-MHz Pentium systems to below $4,000 (with monitor and keyboard); Apple's Power Mac 8100 prices remain at $4,249 for the base configuration (without monitor or keyboard). Apple would not comment on future Power Mac price reductions.

IBM also announced initial pricing for the PowerPC 603 chip, which is slated for laptops and other machines that require low energy consumption. In lots of 25,000, the 66-MHz 603 will sell for $165 and the 80-MHz chip for $195. / SJS

Upgrade Your Mac II Too

WORRIED THAT POWERPC upgrades don't apply to your Mac model? Rest easy. DayStar Digital, in its quest to bring all Mac owners into the PowerPC era, has signed an exclusive agreement with Apple to provide PowerPC upgrades for the Mac IIci, IIsi, IIvx, IIvi, and Performa 600.

Due in the first quarter of 1995, DayStar's upgrade cards will offer PowerPC 601 chips with clock speeds as high as 100 MHz. The cards will fit in the Mac's PDS (processor-direct slot). Owners of DayStar's Turbo 040 accelerator can upgrade when the PowerPC cards become available; DayStar has yet to set pricing for this line of upgrades. 404-967-2077. / SJS

APPLICATIONS GONE NATIVE

THE FOLLOWING native PowerPC applications shipped recently.

Business		
Voyant 2.0	Brossco Systems	408-461-1416
Networking and Communications		
TCP/Connect II 1.2.1	InterCon Systems	703-709-5500
Publishing and Graphics		
Kai's Power Tools 2.1	HSC Software	310-392-8441
3-D/CAD		
Elastic Reality 1.2	Elastic Reality	608-273-6565
LogoMotion 1.5	Specular International	413-253-3100
Ray Dream Designer 3.1	Ray Dream	415-960-0768
Sketch! 2.0	Alias Research	416-362-9181
Utilities		
Maxima 3.0	Connectix	415-571-5100

COLOR PRINTERS /

DYE-SUB TARGETS WORKGROUPS

Tektronix Phaser 440 boasts 2-ppm print speed.

DYE-SUBLIMATION PRINTERS have always been considered too slow to be used in a high-volume environment. But now Tektronix is offering a dye-sub printer that prints continuous-tone output on letter-sized pages at about two pages per minute — reams ahead of the minutes-per-page ratings standard for many dye-sub printers.

Tektronix attributes the Phaser 440's speed to the combination of an AMD RISC processor, an Adobe PostScript Level 2 interpreter in hardware, and proprietary software. The printer ships with 16 MB of RAM, expandable to 64 MB (32 MB is required for printing full bleeds on oversized paper).



Another traditional drawback for business users is that dye-sub printers excel at printing photographic images but are less successful at printing text and line art — the bread and butter of corporations. The Phaser 440 employs Tektronix' Photofine software to sharpen text and line art.

For corporate sites or large design studios, the Phaser 440 offers a host of network connections: Parallel, serial, and AppleTalk ports are standard; Ethernet is optional.

Tektronix has set an aggressive price of $7,995 for the new printers. Per-page costs are about $2.25 for a letter-sized page printed in three colors and about $4 for an oversized four-color page. 800-835-6100 or 503-682-7377. / Pamela Pfiffner



CoSA Courts Casual Users

MULTIMEDIA FOR THE MASSES is the goal of Apple's new 630 line of low-cost AV Macs. Now CoSA is making it possible for more users to get the special-effects power of its $1,995 package After Effects for about a quarter of the cost.

Priced at $595, AfterImage 1.0 delivers many of the same special effects available in After Effects 1.1. Like After Effects, AfterImage gives users the tools to animate still images as well as QuickTime movies in an easy-to-use key-frame-animation system. AfterImage works well for users who need a resolution of only 640 x 480 pixels and limited import/export options, but it lacks many of the professional features of After Effects 2.0. 206-628-4526. / Sean J. Safreed

HARD DRIVES /

PLI's Low-Cost RAID System Delivers

SERIOUS DESKTOP-VIDEO junkies inevitably resort to buying a RAID system. But although the acronym RAID stands for redundant array of inexpensive disks, the phrases *low cost* and *disk array* seldom go together.

That's not the case with PLI's QuickArray-Wide. Compared to most Wide SCSI-2 arrays, which cost as much as a midsize sedan, the QuickArray-Wide is expected to cost about $4,500 for a 1-GB model, on up to about $8,000 for a 4-GB one.

The highest-speed disk systems available typically require special Wide (16-bit) SCSI-2 drives (read: expensive) as well as a NuBus Wide SCSI-2 host adapter card, such as PLI's QuickSCSI-FW ($799).

But the PLI QuickArray-Wide combines a pair of inexpensive "narrow" (8-bit) drives with a single Wide SCSI-2 connection, making for a speedy and affordable Wide SCSI-2 disk array.

For those who are handy and want to build their own RAID system with their own drives, PLI sells a kit version for $1,495. For adding on to an existing RAID system, you can purchase additional drive modules from PLI for $99 each. 800-288-8754 or 510-657-2211. / J. Milstead



LASER PRINTERS /

LaserMaster Edges Up Resolution

THE QUEST FOR HIGHER resolutions from desktop laser printers continues with LaserMaster's 1,800-dpi models, which bring imagesetter-like quality to plain paper at a fraction of the imagesetter price.

Dubbed plain-paper typesetters, the Unity 1800XL-O ($8,995) and the Unity 1800XL ($6,995) achieve 1,800-dpi resolution from 600-dpi engines through a proprietary interpolation technology called TurboRes. The printer's TurboGray halftoning process enables smoother gray-scale printing, and the ClearCopy feature automatically adjusts image contrast in preparation for photocopying.

Powered by a 66-MHz proprietary processor and including 24 MB of RAM, the Unity 1800XL-O can print on paper as large as 12 x 19.5 inches, including full bleeds on 11-x-17-inch documents with registration and crop marks. The Unity 1800XL has a 33-MHz processor and 16 MB of RAM. Both printers sport 240-MB internal hard drives; the Unity 1800XL-O's contains 235 preinstalled Type 1 fonts, and the Unity 1800XL's has 135.

Each printer reaches 8 ppm for letter-sized paper (4 ppm for ledger paper); emulates PostScript Level 2 and PCL 4 via a PowerPage interpreter; and supports LocalTalk, parallel, and serial connections. The Unity 1800XL-O also includes built-in Ethernet and supports EtherTalk, TCP/IP, and Novell NetWare protocols. 612-944-9330. / Jason Snell

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2

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Date Of Birth (Month/Day/Year)		Mother's Maiden Name		Home Phone Number And Area Code ()			Name Home Phone Is Listed Under
Previous Home Address, Number And Street			City Or Town		State	Zip Code	Years There

Please Tell Us About Your Job

3

Business Name Or Employer		Position	Years At Job	Business Phone Number And Area Code ()
Check Here If You Are: ☐ Retired ☐ Self-Employed	If Retired Or Self-Employed, Give Bank Name	Bank Phone Number And Area Code ()		Bank Account Number

About Your Income

4

You do not have to include alimony, child support, spouse's income, separate maintenance or other income unless you want us to consider it in connection with this application. Your total **yearly** income from all sources must be at least **$12,000** to be considered for cardmembership.

Your Total Personal **Yearly** Income — Other **Yearly** Household Income

Other **Yearly** Income Sources

Important Account Information

5

Please Check Those That Apply. Be Sure To Specify Bank/Institution Name.

☐ Money Market/ Investment Account — Bank/Institution Name:

☐ Checking Account — Bank/Institution Name:

☐ Savings Account — Bank/Institution Name:

☐ Visa/MasterCard ☐ Diners Club ☐ American Express
☐ Dept. Store/Sears ☐ Gasoline ☐ Other

Would You Like An Additional Card At No Charge?

6

If Yes, **Print** The Name Of The Additional Cardmember (First, Middle, Last)

Please Tell Us About Your Computer Use

7

Do You Own A Computer? ☐ Apple ☐ Other ☐ None

Do You Use Your Computer At? (Check Those That Apply) ☐ Home ☐ School ☐ Business

Please Sign This Authorization

8

I certify that I meet/agree to all the Citibank credit terms and conditions on other side. Please allow 30 days to process this application.

Applicant's Signature
X

Date

FOLD, MOISTEN ALL THREE SIDES, SEAL AND MAIL.
HAVE YOU INCLUDED YOUR ☐ SOCIAL SECURITY NUMBER ☐ PHONE NUMBER(S) ☐ SIGNATURE?

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HAGERSTOWN MD 21749-9972

IMPORTANT!
This application cannot be processed unless sections 1-8 are completed.

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Annual Fee	None first year. $20 thereafter.
Annual Percentage Rate	Currently (August 1, 1994) 16.65% for purchases; 19.8% for cash advances
Variable Rate Information	The annual percentage rate for purchases may vary each calendar quarter. We will calculate the variable rate by adding 9.4% to the rate disclosed as the U.S. Prime Rate as reported in the "Money Rates" table of *The Wall Street Journal* on the third Tuesday of March, June, September and December of each year. Because the annual percentage rate is variable, the current rate may not be in effect when your card is issued. This rate will not be lower than 12.9% or higher than 19.8%. However, if a cardmember fails to keep all his/her Citibank accounts in good standing, the rate will increase to 19.8% on the full purchase balance.
Grace Period For Purchases	20-25 days
Minimum Finance Charge	50¢
Method of Computing The Balance For Purchases	Average Daily Balance (including new purchases)
Late Fee On Purchases And Cash Advances	$15
Transaction Fees For Cash Advances	At a financial institution or by check, 2% of amount of advance but not less than $2 or more than $10. At an Automated Teller Machine: $1.75
Over-The-Credit-Limit Fee	$10

The information about the costs of the card described in this application is accurate as of August 1, 1994. This information may have changed after that date. To find out what may have changed, write to Citibank at P.O. Box 6116, Sioux Falls, SD 57117-6116.

By signing this application, I authorize Citibank (South Dakota), N.A. ("Citi") to check my credit history, and I authorize any references listed to release information to you or any of your affiliates regarding my eligibility for the Apple Citibank credit card and any renewal or future extension of credit. I certify that I am 18 years of age or older, and that the information provided is accurate. If I am issued a card, I authorize you to exchange information about how I handle my account with Citibank, credit bureaus and proper persons. If I request an authorized user to be added to my account, I understand that account information will also be reported to credit bureaus in the authorized user's name. I authorize your affiliates to perform certain customer service and payment processing functions for my Citibank credit card account. I also authorize you, and your affiliates to periodically exchange information regarding any account(s) I may have with you or your affiliates. I understand that if I use the card or authorize its use or do not cancel my account within 30 days after I receive the card, the Citibank Agreement sent to me with the card will be binding. I have read and understand the disclosures above.

In order to be considered for an Apple Citibank card you must complete and sign the application. Omission of any information requested may be reason for denial.

Apple Rebates are calculated at 2.5% on your total annual net purchases up to $3,000 and 5% on total annual net purchases over $3,000. Apple Rebates are not earned on returned purchases, transferred balances, cash advances, fees and finance charges. Apple Rebates cannot be applied to any applicable sales tax, shipping and handling. Apple Rebates are subject to a maximum of $500 over any 12 consecutive months, for a maximum rebate of $1,500 over any three-year period. A minimum of $20 in Apple Rebates is required each time you redeem. Dates and limitations will be provided upon cardmembership.

The Apple Rebate Program ("Program") is provided by Apple Computer, Inc. ("Apple") which is solely responsible for Program operation and rebate credit and fulfillment. Citibank (South Dakota), N.A. ("Citibank") is the issuer of the Apple Citibank card. Holders of the Apple Citibank card are entitled to participate in the Program. Citibank also performs certain administrative services for Apple in connection with the Program.

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CB-0659A (8/94)

UTILITIES /

NORTON UTILITIES RETURNS

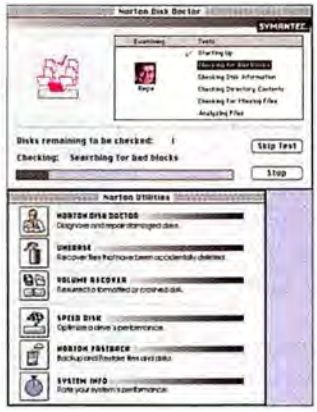
3.0 has faster modules, better data recovery.

LASSIE WASN'T THE ONLY old favorite updated this summer: Symantec's Norton Utilities for Macintosh (NUM) has received its first major upgrade in more than two years, and like the clever collie, NUM 3.0 may attract a new generation of fans.

This version brings tighter integration and faster operations to the disk-utility package and adds several new capabilities, some of which originated in products by Fifth Generation Systems, which Symantec acquired last year.

Improved code makes modules faster than in NUM 2.0, and Power Mac users will reap additional speed benefits from these newly native PowerPC modules: the disk optimizer Speed Disk, the file locator Fast Find, and the file eraser Wipe Info.

For better data recovery, NUM's diagnostic tool, Disk Doctor, has added technology from Fifth Generation's Public Utilities. Also benefiting from that acquisition is NUM's data-backup component, which has been replaced with a faster module built around Fifth Generation's Fastback. Renamed Norton Fastback, it sports a new interface and for the first time supports backup to tape drives.



Following in the footsteps of the dodo are the NUM 2.0 modules KeyFinder, Norton Encrypt, Norton Partition, and Layout Plus. Support for System 6.x is also discontinued in NUM 3.0, although version 2.0 will remain available for users of older systems. $149; upgrade, $39.95. 408-253-9600. / Jim Shatz-Akin

BUSINESS TOOLS /

Feed Your Fax

GETTING PAPER DOCUMENTS into digital form can be a pain — especially if you're forced to use a bulky flatbed scanner. But Visioneer's PaperMax and MaxMate scanner/software combination provides a compact, easy-to-use system for prepping documents for OCR and faxes. The PaperMax is a 2.5-pound 200-dpi black-and-white scanner sporting a 12.5-x-3-inch footprint — small enough to take on the road. When you insert a page into the PaperMax, the MaxMate software automatically launches, and it feeds the document through the scanner. Users can then fax the document image; apply OCR either by using the software bundled with the PaperMax or by using other Mac OCR packages; or e-mail the image files. $599. 415-812-6400. / JS



LEGAL DISPUTES /

FreeHand Set Free

THE BIG QUESTION MARK of the proposed merger of Adobe and Aldus has been the fate of FreeHand, Aldus' illustration program and Adobe Illustrator's long-term rival. Fearing that Adobe would kill the product in favor of Illustrator, FreeHand's developer, Altsys, sued Aldus to get it back by claiming breach of contract. Things got messy for a while, but it's over now. Altsys won.

If the Adobe/Aldus merger goes through, all rights for FreeHand will revert to Altsys on January 15, 1995. Should the merger not go through, Aldus and Altsys will either renegotiate the contract or let it expire.

Despite rumors that Altsys would sell off FreeHand if it regained control of the program, the company intends to support the product itself and is ramping up its customer and tech support for next year. Given Alysys' track record with Fontographer, FreeHand users have reason to rest easy. / Pamela Pfiffner

KID'S STUFF /

Software Is Child's Play

GETTING KIDS EXCITED about playing on a computer is easy, but providing software that keeps them interested is a challenge. These three new software packages offer sparks to ignite your child's imagination.

Launch Pad, from Berkeley Systems, is a colorful animated Finder replacement (although adults can still access the Finder with a special password). From the Launch Pad rocket car, children can explore different worlds, including an enchanted castle and a dinosaur-populated swamp. The worlds double as document folders — kids can place applications and documents in each of Launch Pad's different areas. Files are saved in a special compartment on the rocket car's dashboard. Children have individual Launch Pad accounts, so adults can grant them special privileges. And kids who can't read yet will benefit from the speech synthesizer, which can speak menu options out loud. $50. 510-540-5535.

Kids World, from Bit Jugglers, isn't another screen-saver package — instead, it's a screen-saver construction set made for kids. It provides more than 100 pieces of art — including multiframe animations — that can be placed anywhere. Painting tools allow kids to add their own art to the pictures included in the package. Kids World screen savers can be saved and played as modules by Bit Jugglers' UnderWare engine, which is included in the Kids World package. $60. 415-968-3908.



Art Explorer, from Aldus Consumer Division, is targeted at children who have outgrown such programs as Brøderbund's Kid Pix. Art Explorer's sets of background pictures and clip art let kids create their own characters in superhero, horror, or fashion-show worlds. Kids can use Art Explorer to paint and apply different effects to images, including the clip art itself. And the truly adventurous can mix and match clip art — adding a floppy hat from a Fashion World supermodel to the head of a strapping lad from Superhero World could go a long way toward educating kids about gender stereotyping. $50. 619-558-6000. / Jason Snell

NEW & NOTABLE

HARDWARE /

Plextor 4PleX. The latest in the never-ending quest to speed up CD-ROM drives, Plextor's drive spins a CD-ROM at four times the normal speed, offering a 600K-per-second data-transfer rate and a 1-MB buffer. Internal, $549; external, $699. 408-980-1838.

Proxima Ovation 920. Offering resolutions as high as 1,024 x 768 pixels, this 10.4-inch active-matrix LCD projection panel can display 21-bit color from 24-bit-video signals. Its LightBoard feature allows users to draw screen overlays or use the display as a traditional white board. $14,595. 619-457-5500.

▼ **Fargo PrimeraPro.** An inexpensive color printer that goes both ways, the PrimeraPro can produce photographic-quality, 24-bit-color proofs via dye sublimation or fast comps via thermal-wax transfer. Top resolution is 600 x 300 dpi on letter-sized media. The PrimeraPro ($1,895) ships with either a parallel or a LocalTalk interface. Adobe PostScript Level 2 is an extra $300. 612-941-7836.



Nanao FlexScan T2•17. Bundled with Colorific color-management software for use in color calibration, Nanao's 17-inch monitor displays resolutions as high as 1,600 x 1,200 pixels at 66 Hz and 1,280 x 1,024 pixels at 80 Hz. The monitor also includes moiré-reduction and tilt-adjustment features and an energy-saving Standby mode. $1,300. 310-325-5202.

CoStar LabelWriter XL and XL Plus. These two label printers from CoStar print at 203 dpi on mailing, file-folder, and even smaller labels. The XL Plus also prints on shipping, 3.5-inch-disk, and ID-badge labels. An option to connect the printer to an AppleTalk network is available. LabelWriter XL, $250; LabelWriter XL Plus, $300. 203-661-9700.

SOFTWARE /

Connectix Desktop Utilities 1.0.4. Energy-saving features highlight this new version of CDU, which has been certified Energy Star-compliant by the U.S. government. After a designated period of idle time, CDU automatically saves all open files and shuts down. The next time the Mac is turned on, CDU relaunches all applications and reloads all documents that were open at shutdown. $99. Connectix. 415-571-5100.

ChartMaker. A stand-alone application, ChartMaker works with other applications to create charts for use in brochures, presentations, and other kinds of documents. $149. Aldus. 206-628-2320.

Drive7 3.0. Speeding up hard drives and removable-media drives through disk caching is one of the features of the latest version of this hard-disk-formatting utility. Drive7 also supports SCSI Manager 4.3 and is Power Mac-compatible. $90. Casa Blanca Works. 415-461-2227.

SuperCard 1.7. The long-awaited upgrade to this multimedia scripting environment features integrated QuickTime and text-to-speech support, the ability to create multiframe animations and hypertext hot links, and more than 70 enhancements to the SuperTalk scripting language. $495. Allegiant Technologies. 619-587-0500.

▼ **After Dark 3.0.** The new version of this venerable screen saver includes pro versions of Fish and Flying Toasters — with a karaoke anthem — and new concepts such as the twisted trivia game You Bet Your Head, plus energy-saving features. $50. Berkeley Systems. 510-540-5535.



Spectre VR CD. The multiplayer tank game gets a multimedia upgrade with this CD-ROM version. QuickTime video clips appear before each game level and also run during game play. $60. Velocity. 415-776-8000.

CAL. This four-module set of utilities features a talking calculator (which also accepts voice commands from PlainTalk-capable Macs), a formula editor with 44 built-in formulas, a calendar, and a date book. $80. Thought I Could. 212-673-9724.

BLURB OF THE MONTH

"IN FUNGUS PATROL you are tethered to a ship by a bungee cord, and must jump in the direction of the fungus spores that have to be cleaned up. But, if the fungus gets to the bungee cord before you get to the fungus, it eats through the cord and the game is over." / Press release describing Alien Arcade, a collection of six nonviolent games from Luxenberg Software (P.O. Box 253, Cornwall Bridge, CT 06754)

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of July 11, 1994. Prices (except those for compact models and Performas) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used microcomputer equipment.

Mac Model	New	Used
Plus (1/20)	•	$150
SE (1/20)	•	$250
SE/30 (5/40)	•	$600
Classic (2/40)	•	$400
Classic II (4/40)	•	$550
Color Classic (4/80)	•	$700
LC (2/40)	•	$325
LC II (4/40)	•	$425
LC III (4/80)	•	$500
Performa 475 (4/160)	$1,499	$1,300
Performa 550 (5/120)	$1,799	$1,600
II (5/40)	•	$350
IIsi (5/40)	•	$525
IIcx (5/40)	•	$450
IIci (5/80)	•	$700
IIfx (8/160)	•	$950
IIvx (4/80)	•	$975
Quadra 605 (4/80)	•	$700
Quadra 610 (8/230)	$1,399	$1,125
Quadra 650 (8/230)	$2,069	$1,775
Quadra 660AV (8/230)	$1,399	$1,275
Quadra 700 (8/230)	•	$1,400
Quadra 800 (8/230)	$2,299	$2,025
Quadra 840AV (8/230)	$2,599	$2,350
Quadra 900 (8/230)	•	$1,700
Quadra 950 (8/230)	$3,599	$2,400
Power Mac 6100 (8/160)	$1,649	$1,500
Power Mac 7100 (8/250)	$2,829	$2,575
Power Mac 8100CD (8/250)	$4,399	$3,975
PowerBook 100 (4/20)	•	$625
PowerBook 140 (4/40)	•	$775
PowerBook 145 (4/40)	•	$875
PowerBook 145B (4/80)	•	$1,025
PowerBook 160 (4/80)	•	$1,200
PowerBook 165 (4/80)	$1,399	$1,250
PowerBook 165c (4/80)	•	$1,475
PowerBook 170 (4/40)	•	$1,325
PowerBook 180 (4/80)	•	$1,800
PowerBook 180c (4/80)	•	$2,175
Duo 210 (4/80)	•	$1,050
Duo 230 (4/120)	$1,529	$1,275
Duo 250 (4/200)	•	$1,500
Duo 270c (4/240)	•	$2,150

• = discontinued model

For more pricing information on these models and on configurations not listed, call 800-755-3033 or 404-955-0569 or find it on ZiffNet/Mac, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC:MACUSER), as UCEIDX.WRD (Microsoft Word format) and UCEIDX.TXT (ASCII text format); on AppleLink, look for it in ZiffNet Selections:MacUser Software:Reference.



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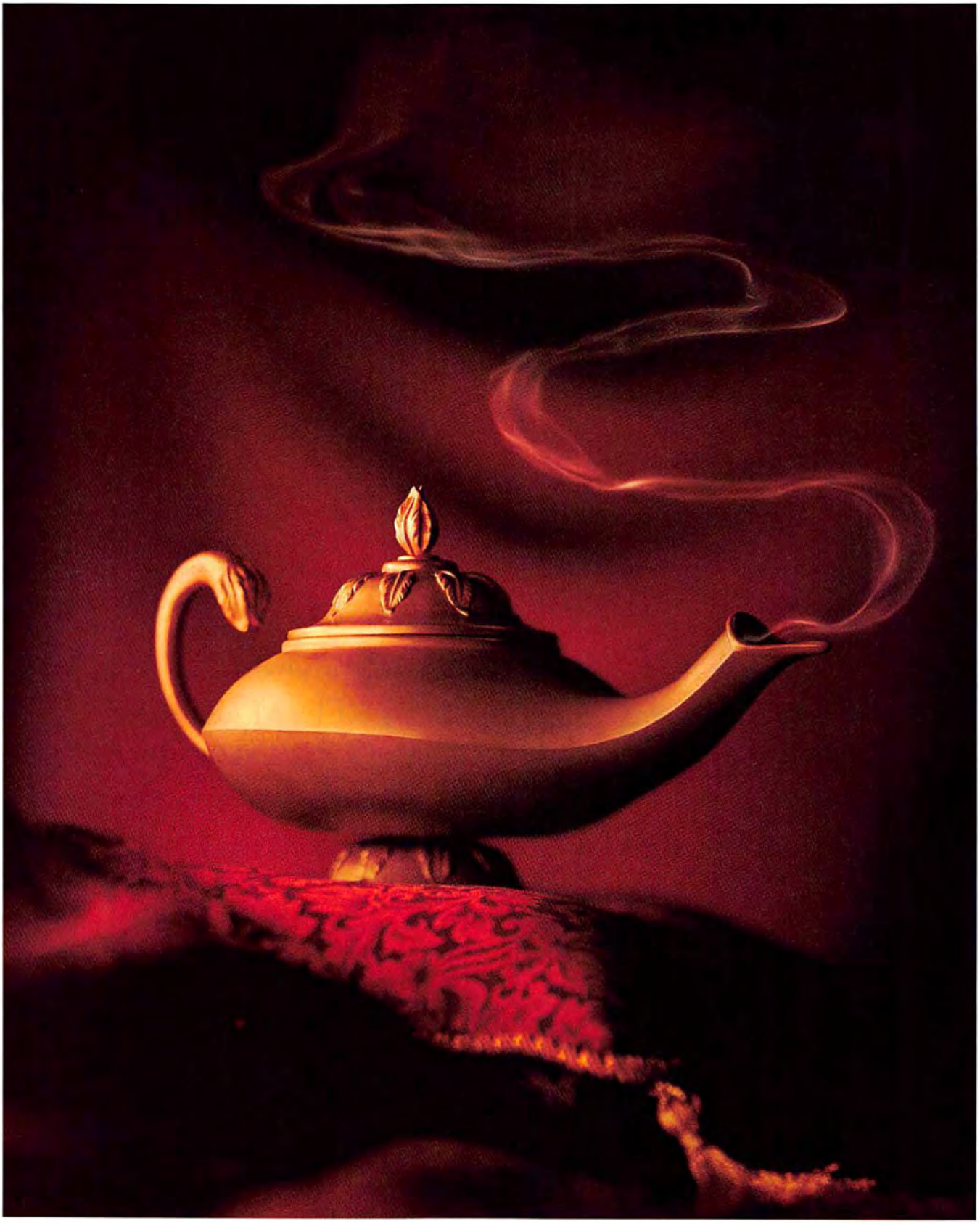
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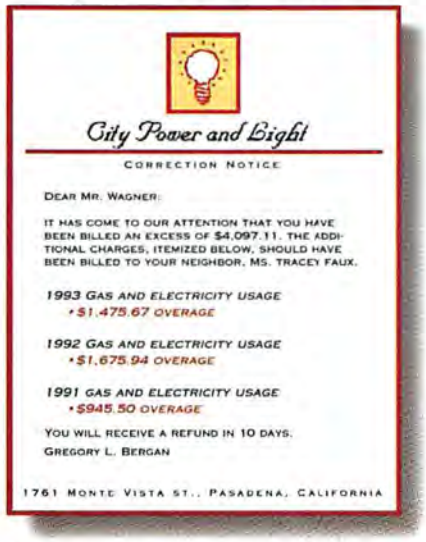
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Introducing new Microsoft® Word 6.0 for the Macintosh® and Power Macintosh™.



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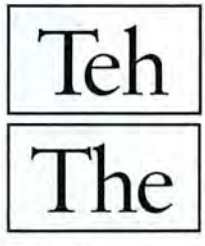
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This technological wizardry is also evident in something we call Table AutoFormat. To format tables, just point and click on any of the 34 different styles.

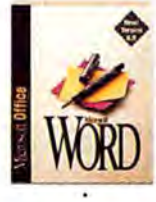
But what's truly magical about new Microsoft Word 6.0 is how it works with other Office programs. It's never been easier to exchange text, data and graphics between programs. All you have to do is just drag it and drop it into place.

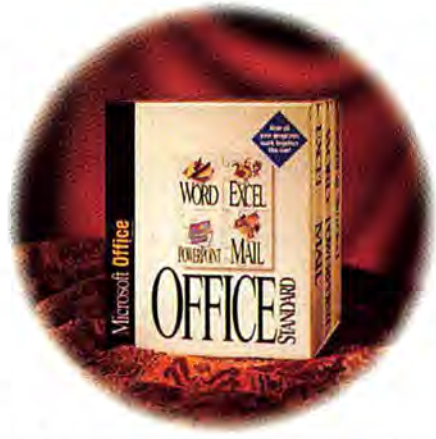
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Microsoft Word 6.0 is the latest version of the world's most popular word processor for the Macintosh. It's also part of Microsoft Office family.

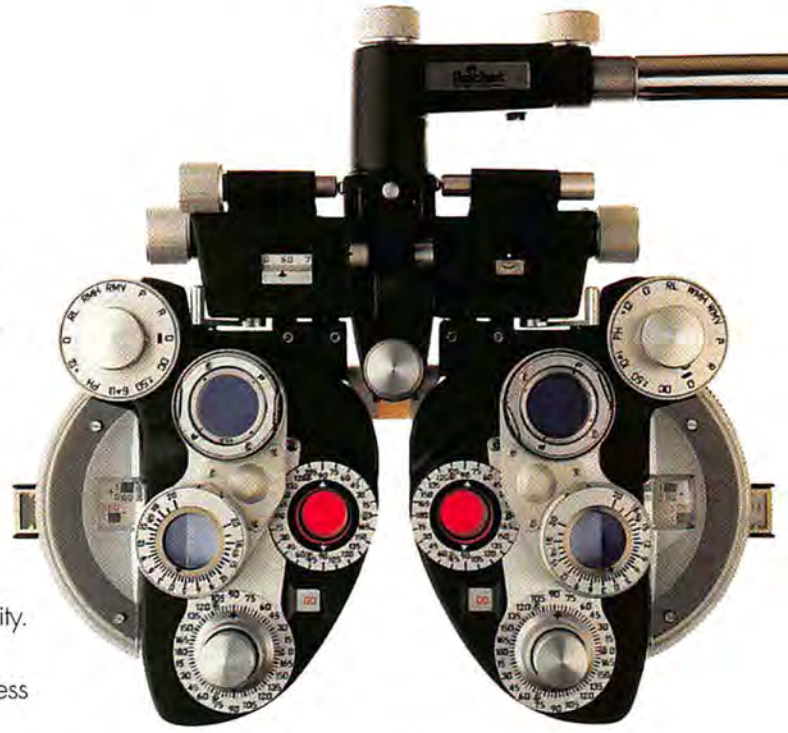




Microsoft Office

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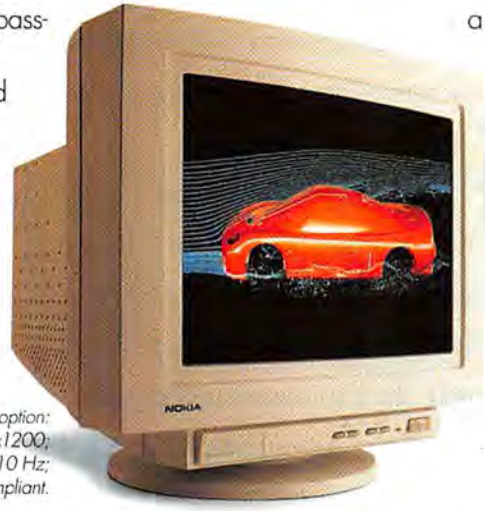
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PHOTOGRAPHY / LEON

SuperMac ProofPositive and Tektronix Phaser 480 / Dye-sub printers offer picture-perfect output.

TO ACHIEVE NEAR-photographic-quality printer output, few technologies can compete with dye sublimation. Those that do, such as the inkjet output from Iris printers, come with much higher price tags. So it's no surprise that dye-sublimation printers capable of producing full-bleed tabloid-sized output are gaining acceptance as both proofing systems for color prepress and as final-output devices for digital photographs. We looked at two of the most popular offerings, the $14,999 SuperMac ProofPositive and the $14,995 Tektronix Phaser 480, and put them through their paces, evaluating their strengths for both prepress and photographic applications.

MacUser ZD LABS

Reviews Rating Key

★★★★★	Outstanding
★★★★	Very Good
★★★	Acceptable
★★	Poor
★	Seriously Flawed
💣	Dangerous

If you just look at the spec sheets, the two printers appear similar, but we discovered that each offers distinctly different strengths and weaknesses. The ProofPositive system — which uses the software-based Adobe CPSI (Configurable PostScript Software Interpreter) — offers more in the way of features and flexibility, but you pay a price in speed and a steeper learning curve. The Phaser 480, with its RISC-based built-in Adobe PostScript Level 2 interpreter, wins hands down for speed and ease of use.

SuperMac ProofPositive

The ProofPositive is a talented printer, but it's decidedly more complex to configure than the Phaser 480. Although installing the consumables is slightly easier, because you don't have to install hubs on the ribbon, the rest of the setup is trickier. The printer connects to the host Mac via a SCSI-adapter box that contains built-in switchable termination and an ID selector.

The SCSI-adapter box also lets you connect a hard drive to the printer that serves as an image buffer. The hard drive is separate from the host Mac's SCSI bus, and using it frees up the Mac more quickly, because the computer can spool images to the hard disk rather than to the printer. And if you're printing multiple copies of a single image, using the hard drive lets you print as many as 99 copies of the image without resending it to the printer. A 180-MB or larger hard drive is required.

One other advantage of the image buffer is that it enables the ProofPositive to show trapping and overprinting as well as to print composite-EPS DCS files — a plus when you consider that most color printers (including the Phaser 480) ignore overprinting instructions and print only the screen-preview image of a DCS file.

For PostScript printing, the ProofPositive uses Adobe's CPSI software, a PostScript Level 2 interpreter that runs on the host Mac. CPSI requires a Mac IIci or later with at least 12 MB of RAM. For optimal performance, CPSI needs a hefty 84 MB of RAM. The CPSI Server application, which is also installed on the host Mac, enables other Mac users on a network to use the CPSI node software. For those users, the ProofPositive appears in the Chooser, just like any PostScript printer. In most situations, you will want to dedicate a Mac to driving the printer.

The ProofPositive includes a Photoshop Export module for direct printing from Photoshop. You can use it only on the host Mac, but it can be fast.

Last, the ProofPositive comes with EFI's EfiColor software for color matching, so you can set the ProofPositive to simulate SWOP (Specifications for Web Offset Publications) or newsprint presses as well as designate an image-source type. Typically, you would use

EfiColor Calibrated RGB to match RGB color on a calibrated monitor or select one of the press profiles to designate a CMYK scan. Advanced users can use the ProofPositive software to define their own color-correction curves, which can make the difference between a good color match and an approximate one.

For critical press-matching applications, SuperMac has developed a new ribbon set in conjunction with Hoechst, which is well-known in prepress circles for its proofing systems. The new ribbon delivers cleaner neutrals and better reproduction of colors with a high magenta component than the original ribbon, which is still the preferred one for photographic use. SuperMac also offers a semimatte paper stock for photographic output that gives a lustre finish rather than the high-gloss finish typical of dye-sublimation output.

Tektronix Phaser 480

The Phaser 480 comes as close to plug-and-play as any dye-sub printer we've seen. Setup involves removing a few well-marked packing pieces, installing color-coded hubs on the ribbon, dropping the ribbon into place, and loading the paper in the tray. The nonprinting side of the paper is clearly marked. Tektronix supplies a special modified version of the LaserWriter 7.1.2 driver that provides access to the printer's special paper sizes and color-correction modes. The company also supplies a PPD (PostScript Printer Description) file for use with the LaserWriter 8 driver.

You can connect your Mac to the printer via the printer's AppleTalk port, although serious graphics users will want Tektronix's optional $495 networking card, which provides support for the EtherTalk and Novell NetWare protocols (TCP/IP support costs an additional $295).

The Phaser 480 offers three built-in color-correction modes for press matching — SWOP, Euroscale, and commercial sheet-fed press — and two for photographic use — Vivid Blues and Simulate Display. You can also turn off color matching.

For most applications, the Tektronix-supplied driver offers the most convenient method of printing — all print options are readily accessible in the Print dialog box. Printing from PageMaker, however, requires the use of the LaserWriter 8 driver. Although you *can* use the Tektronix driver, color accuracy is thrown off because any CMYK colors in the document are converted to RGB, using QuickDraw, and then converted back to CMYK in the printer. To access the various color-correction modes, you can either run a small Tektronix-supplied utility that sets the printer to the desired mode or use DIP switches on the printer's rear panel.

The other special case is printing from Photoshop. Here, using PostScript simply adds overhead to the print process, so the Phaser 480 has a Photoshop Export module that bypasses the PostScript interpreter and sends pixel data directly to the printer. With the export module, you can choose color-correction modes and paper sizes as well as scale the image to fit the paper without being forced to calculate the necessary scaling percentage.

Put to the Test

Our speed tests showed the Phaser 480 to be the faster of the two printers by far, both in raw engine speed and in PostScript processing. Overall, the Phaser 480 proved to be about four times faster than the ProofPositive with CPSI running on a dedicated Quadra 950 that had 46 MB of RAM. Testing engine speed alone, the Phaser 480 took slightly less than four minutes to print out a tabloid-sized page, compared with slightly less than seven minutes for the same page, using the ProofPositive. However, tests performed with a native PowerPC beta version of CPSI and the ProofPositive indicate that the Phaser 480's speed advantage may be only temporary — CPSI running on a Power Mac gives the ProofPositive speed that's close to that of the Phaser 480 with its embedded controller.

The image quality of both printers is excellent. The Phaser 480 has a slight edge over the ProofPositive for text, due largely to its tighter registration — the ProofPositive needs frequent cleaning to maintain good registration between the different color passes. However, the ProofPositive does a noticeably better job of press matching than does the Phaser 480, particularly in light neutral areas. With color correction turned off, output from the Phaser 480 has a cyan cast that the color-matching modes eliminate, but at the cost of introducing a pinkish cast in highlighted and neutral areas. For photographic rendering, the ProofPositive offers more saturation than the Phaser 480, with more vibrant colors. Moreover, the ProofPositive's ability to show traps should be kept in perspective — for most jobs, typical trapping values will result in a trap that's only one printer pixel wide. However, the ProofPositive's ability to show overprinting is useful, and the ability to print DCS files using the actual image data rather than the screen preview is a huge advantage.

The Bottom Line

The SuperMac ProofPositive dye-sub printer boasts several advanced features, but it's considerably more complex to use than the Tektronix Phaser 480 and requires more maintenance. And if you want to print DCS files, show traps and overprinting, and print any reasonable volume of PostScript jobs, you must add the costs of a hard drive for buffering images and a dedicated Mac to the cost of the printer. The Phaser 480, on the other hand, is strictly plug-and-play, is much faster, and doesn't require any extra equipment.

Sophisticated prepress shops that need excellent color accuracy and that can take advantage of the ProofPositive's extra features will find it compelling. Sites that value speed and ease of use will be better served by the Phaser 480. Each is excellent in its own way. / Bruce Fraser

SuperMac ProofPositive

Rating: ♦♦♦♦

List Price: $14,999.

Pros: Excellent color quality and accuracy. Prints EPS DCS files. Shows traps and overprinting.

Cons: Complex setup. Additional hardware required for volume printing.

Company: SuperMac, Sunnyvale, CA; 800-334-3005 or 408-541-6100.

Reader Service: Circle #401.

Tektronix Phaser 480

Rating: ♦♦♦♦

List Price: $14,995.

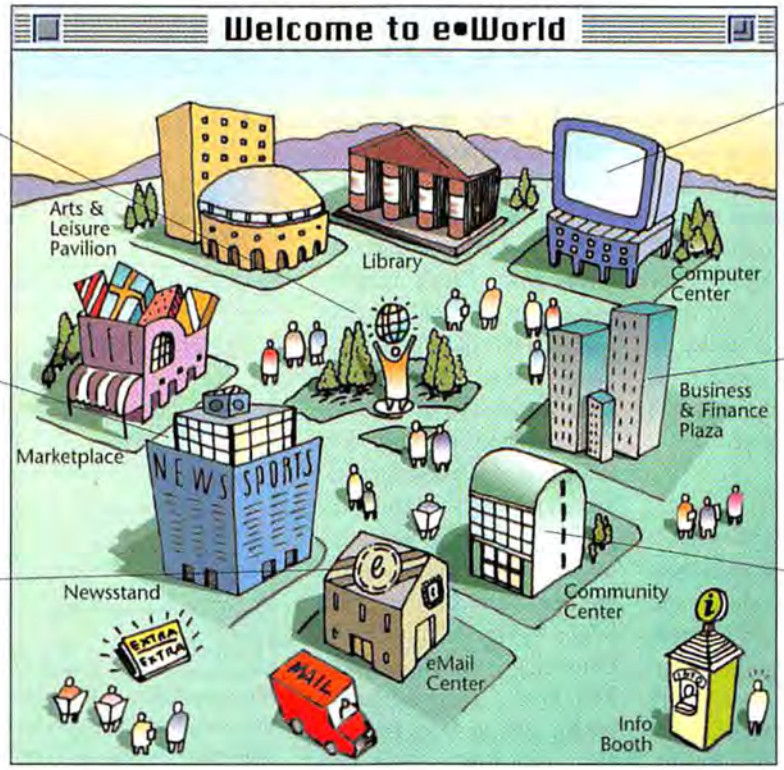
Pros: Plug-and-play setup. Faster than the ProofPositive.

Cons: Doesn't show traps and overprinting. Can't print EPS DCS files.

Company: Tektronix, Wilsonville, OR; 800-835-6100 or 503-682-7377.

Reader Service: Circle #402.

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Microsoft Works 4.0 / All-in-one software works hard for budget-minded buyers.

MATCHING CLARISWORKS' most outstanding feature, the latest version of Microsoft Works lets you work with different types of data on a single page, so you don't have to constantly switch from one module to another. Plus it adds a calendar, paint tools, table and slide-show creation, and a variety of other nifty features to the prior version's five main modules for word processing, database management, spreadsheet creation, drawing, and communications. And you can buy Microsoft Works for about half the usual discounted price of ClarisWorks. These advantages aside, we found Microsoft Works 4.0 somewhat compromised by several annoying quirks and a gargantuan appetite for disk space.

Feature Rich

The list of improvements in version 4.0 is long. The word processor now lets you wrap text around graphics and other objects and add endnotes and footnotes. The program still lacks an outliner and style sheets, but you can automatically apply bullets and copy and paste formats. And you'll find several everyday conveniences, such as a word-count command and drag-and-drop text editing, that are still missing from ClarisWorks.

For graphics, Microsoft didn't just add basic paint tools — you also get gradient fills and a menu of special effects, such as Posterize and Despeckle. You can even add Adobe Photoshop plug-ins, although you are still limited to 8-bit color. The drawing module has gained a slide-show feature, complete with master pages, QuickTime support, and dual-screen options.

You still can't edit directly within spreadsheet cells, but there's now a handy AutoSum button. Works has only six chart types, so its charting is much more limited than that of ClarisWorks, but at least the new version lets you link charts to the underlying data for automatic updating — a truly welcome addition. The database-management module boasts the new ReportCreator, which brings together all options for generating multiple reports. And Works' communications module now includes Ymodem and Zmodem file-transfer tools.

New in this release are WorksWizards — special screens that automate complex tasks. WorksWizards make the process of creating newsletters, greeting cards, and certificates a snap. Also new are two personal-information-management features — a calendar and an address book — each of which is readily accessible from the tool bar. You can attach an alarm to any appointment or to-do item, and a system extension sounds the alarm even when Works isn't open.

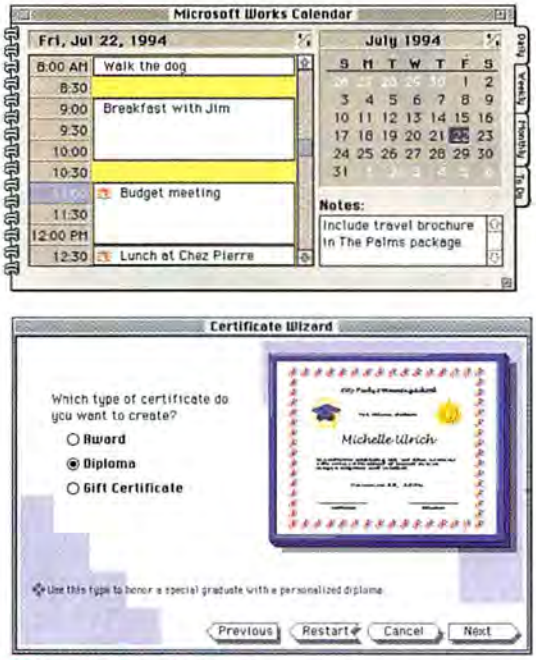
The most significant change to Works, however, is the ability to place and edit text blocks, spreadsheets, and draw and paint objects on the same page. As with ClarisWorks, a simple click and drag lets you add a spreadsheet to your newsletter or a 3-D sketch of your latest invention to your letter to the Patent Office.

You can also embed other types of objects in Works documents, including tables, movies, and data from any application that supports Microsoft's OLE (Object Linking and Embedding) 2.0 technology. Two OLE applications are included with Works 4.0 — Equation Editor and WordArt (a program that applies special effects to text).

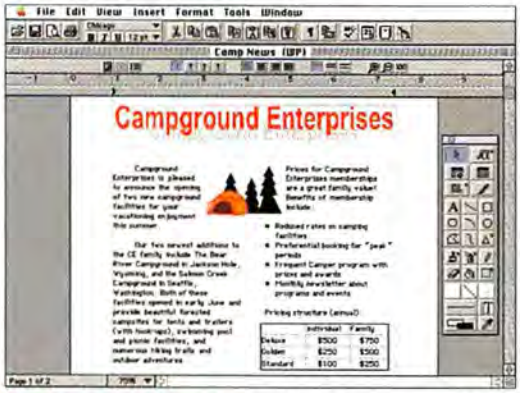
We found that for some tasks, the embedding technology works well. To add an artistic flourish to a memo, for example, you can simply click on a paint-tool icon and go to work. Works automatically creates a paint frame that expands as you work, so you don't have to worry about bumping up against the edges.

However, some other embedding options don't work as smoothly. When we pasted text into story frames (linked text blocks) in a spreadsheet, we suffered screen-redraw problems and crashes. Opening and closing OLE applications was painfully slow. Both the manual and the on-line documentation include information on embedding objects within a line of text, but this option isn't implemented.

Furthermore, the compound documents



Microsoft Works 4.0 offers a broader range of features than the previous version, including a new address book, slide-show creation, and the calendar shown here (top). The new WorksWizards make short work of creating newsletters, greeting cards, and certificates.



No more switching back and forth from one module to another with Microsoft Works 4.0. Using the tool palette, you can work with spreadsheets and draw and paint objects without leaving your word-processing document.

you create with the linking-and-embedding feature present some difficult interface issues, and we found that Microsoft's way of addressing these issues isn't entirely consistent. For example, embedded tables and paint objects have gray, rather than black, frames when activated; draw objects have no frames, but spreadsheet objects sport frames with title and scroll bars; and the Equation Editor automatically quits when you click on the main document but WordArt does not.

Help!

You expect a program aimed at novices to come with lots of help, and Works doesn't disappoint. There's a 680-page manual, an extensive hypertext help system (accessible from the Help menu), and a bit of Balloon Help. Most options are explained clearly, but sometimes it's hard to find what you're looking for. For example, macros are explained only in on-line help and not in the manual, but information on links to Encarta and Bookshelf '94 — Microsoft's new reference CD-ROMs — is available only in the manual. There's Balloon Help for the tool bar and the tool palette but not for the word processor's formatting ribbon or for anything else. Regrettably, Microsoft didn't adopt ToolTips, the new Microsoft Office feature that pops up a helpful text label for tool bar icons.

Works 4.0 requires System 7 and a Mac with a 68020 or more powerful processor and at least 4 MB of RAM. A native PowerPC version is due by the end of the year. A minimum installation takes 5 MB of disk space; the recommended full installation fills a whopping 16 MB. Even more disturbing for those users who have limited disk space is the size of Works' data files — when we compared Works files with ClarisWorks files of identical content, we found the Works files significantly larger across the board. A two-page newsletter file, for example, weighed in at 165K in Microsoft Works and only 22K in ClarisWorks; a 100-record address book required 79K in Microsoft Works and only 25K in ClarisWorks. According to the company, the file-size overhead stems from the OLE technology.

Microsoft Works 4.0

Rating: ★★★½

Street Price: $99.95.

Pros: Wide range of useful features for the price. Support for multiple data types within a single document.

Cons: Heavy hard-disk-space demands. Compound documents suffer from a few rough edges.

Company: Microsoft, Redmond, WA; 800-426-9400 or 206-882-8080.

Reader Service: Circle #403.

The Bottom Line

If you have only $100 to spend on Mac software, Microsoft Works 4.0 is clearly a bargain — it delivers an amazing assortment of features. But if you can afford a little more, ClarisWorks is still the champ in the all-in-one category — it's leaner and faster and offers a smoother level of integration among modules. / Henry Norr



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PLI Infinity 270 Turbo / The Mighty Mouse of SyQuest drives.

IF YOU LOVE THE SPEED and lower price of SyQuest drives but envy the storage capacity that magneto-optical media offers, fret no longer. You will be delighted to hear that the PLI Infinity 270 Turbo SyQuest drive uses 3.5-inch cartridges that can store as much as 270 MB of data.

MacUser ZD LABS

Compact Storage

The diminutive PLI Infinity 270 Turbo measures 7 inches long, 5 inches wide, and 2 inches high. That makes it small enough to fit in the front pouch of a backpack or a large purse. It doesn't have its own internal power supply, so it requires an external bricklike power supply. This can be inconvenient if you tend to misplace power cords.

The PLI Infinity 270 Turbo performed quite well for a removable-media drive. We compared its speed to that of an Epson 128-MB magneto-optical drive and a SyQuest 88c drive, using a Power Mac 6100/60AV with an L2 cache as our test platform. We found that for general system-level tests (using MacBench 1.1), the PLI SyQuest drive completed the tests 161 percent faster than the Epson magneto-optical drive and 17 percent faster than the SyQuest 88c drive. The PLI Infinity 270 Turbo opened and copied an 18-MB Adobe Photoshop file almost three times faster than the Epson magneto-optical drive was able to and half again as fast as the SyQuest 88c drive did.

PLI Infinity 270 Turbo

Rating: ★★★½

List Price: External drive, $651; internal drive (not reviewed), $584; 270-MB cartridge, $98 (formatted), $83 (unformatted).

Pros: Faster and less expensive than magneto-optical drives. Reads from and writes to SyQuest 105-MB cartridges.

Cons: Media more expensive and more vulnerable to dust than magneto-optical cartridges. Slower speed with SyQuest 105-MB cartridges. External power supply.

Company: PLI (Peripheral Land, Inc.), Fremont, CA; 800-288-8754 or 510-657-2211.

Reader Service: Circle #404.



Small and portable, the PLI Infinity 270 Turbo can hold as much as 270 MB of data on one cartridge.

By comparison, an internal hard drive with a Quantum LPS250 mechanism was able to perform the same functions about 70 percent faster than either drive with a SyQuest mechanism.

Cost Conscious

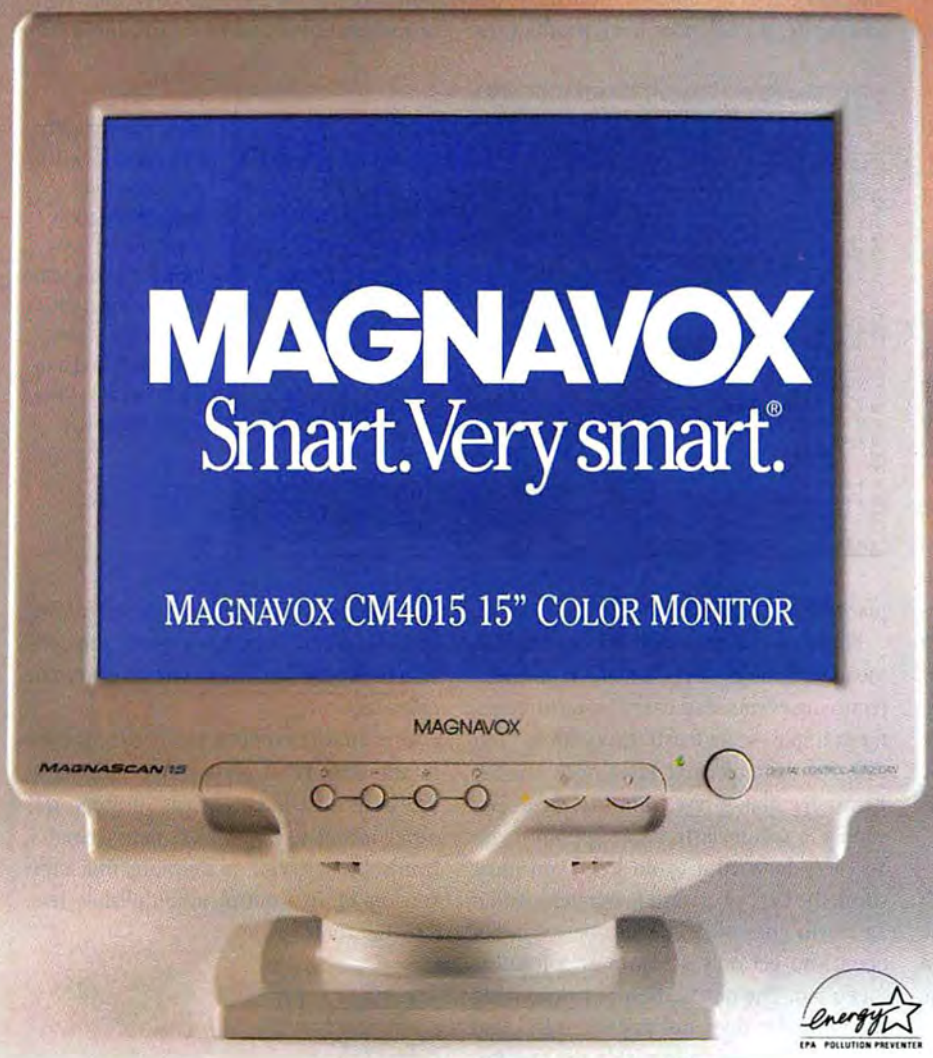
Drives with SyQuest mechanisms have always been the least expensive removable-storage devices, and the PLI Infinity 270 Turbo — approximately $590 street — is no exception. By contrast, an external 256-MB magneto-optical drive costs upwards of $800. If you're willing to put up with an almost 100-percent speed hit, you can also use 105-MB SyQuest cartridges with the PLI Infinity 270 Turbo.

The PLI Infinity 270 Turbo is handy, but we have two caveats. In general, SyQuest cartridges are somewhat vulnerable to dust. And even at $117 for a 270-MB cartridge, the cartridges are more expensive on a cost-per-megabyte basis than magneto-optical cartridges, which currently cost about $55 for 256 MB of storage.

The Bottom Line

With its acceptable speed, reasonable price, and small size, the PLI Infinity 270 Turbo is a nice alternative if you're looking for a portable removable-storage device that lets you access lots of data fairly quickly. PLI is one of the forerunners with this new technology; buyers will soon have a choice — other companies, including APS and La Cie, have plans to release 270-MB SyQuest drives in the near future. / Roman Victor Loyola

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DOT PITCH	N/A	.28	.28	.28	.28	.31	.31
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SCREEN	Non-Glare	Glossy	Non-Glare	Non-Glare	Non-Glare	Non-Glare	Glossy
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In Control 3.0 / Attain's stellar time-management outliner founders as an electronic calendar.

MOST ELECTRONIC calendars feature to-do lists. Attain's In Control, the Mac's premier to-do-list outliner, now features an electronic calendar. It resembles full-blown electronic calendars such as Now Up-to-Date and DateBook Pro. Although In Control earned its reputation as the best time-management outliner, it doesn't deserve the same distinction as an electronic calendar.

Supreme Outlines

In this version, In Control has kept all of its outlining features. You can create a list of to-do items and collapse, expand, indent, or move any item with the ease you'd expect from an outliner. But unlike an outliner, In Control also has separate columns for to-do-item descriptions, start and end times, and priority levels. Pop-up menus make data entry easier and faster. You can sort or match items in any column as you would in a database program. You can even write simple macros.

Almost everything new about In Control becomes obvious when you click on one of its new icon buttons, which bring up a full-screen calendar view, where your tasks appear by week or month; a day view next to a to-do list; or a combination calendar view/day view/to-do-list outline. Multiday banners appear in the calendar view. You can print these views in six formats, including ones that correspond to popular paper organizers such as Day-Timers.

Views are linked to each other. For example, if you select a subset of items — such as high-priority items — to display in the outline view, only those items will appear in the calendar. Conversely, if you select one day in your calendar, only that day's events will appear in the outline view.

Missing Links

Unfortunately, the links between In Control's views haven't been thoroughly implemented. You can set your preferences so that items entered in one view do not appear in another, but if you choose to have items appear in both the calendar view and the outline view, you have no control over how, or where, they appear. If you enter an item into your outline view with a date and time, that item will appear at that date and time in your calendar view. But if you make an entry in your calendar, it will appear only under the outliner's Calendar Items heading, which is separate from the rest of the outline. You can drag copies of these items out from under the Calendar Items heading and place them under other headings.



In Control 3.0 gives you a variety of ways to look at your schedule. The combination view, shown here, includes a calendar view on the right, a day view at the upper left, and a to-do-list outline view at the lower left.

Elements that are automatic or simple in most electronic calendars — reminders, recurring events, and carry-forward items, for example — are frustrating with In Control. For example, you must open the Set Reminder dialog box from the menu bar simply to set an alarm for an appointment. To carry forward a to-do item, you must check the Carry Forward menu item. And if an alarm goes off while In Control is not open, you get only a sound or a flashing menu bar. The notification box describing the reminder does not appear unless you launch In Control from within the new Reminder control panel.

In Control falls behind competing calendars in other ways as well. Its file-sharing capabilities are almost nonexistent. You can't assign a color to an entire item based on category or priority. And you have to be in outline view to change the default font; you can't change it if you're in calendar view.

In lieu of having its own contact manager or a companion product, In Control uses Apple events for launching and looking up data in FileMaker Pro 2.1v2, TouchBase Pro 4.0, Now Contact 1.0, and Dynodex 3.5. Unfortunately, this feature is still in its nascent stages. Only FileMaker Pro 2.1v2 has full Apple-events linking; In Control can look up data in only a few fields in the other contact managers. And when your Mac has problems launching the contact manager, don't count on the error message to tell you why.

The Bottom Line

When it comes to giving you a flexible, easy-to-use, and powerful to-do list, In Control can't be beat. But rather than upgrading In Control's outliner, Attain made the decision to expand In Control into an electronic calendar.

One doesn't expect a top-notch minivan to win awards as a sports car; similarly, the best time-management outliner was never meant to be an electronic calendar. Ironically, by trying to do more, this latest version of In Control accomplishes less. / Ted Landau

In Control 3.0

Rating: ★★½

Street Price: $85.

Pros: Excellent time-management outliner. Customizable calendar views.

Cons: Events created in calendar view do not appear in outline view. Alarms do not bring up their events. Limited data lookup from contact managers.

Company: Attain, Somerville, MA; 800-925-5615, ext. 650, or 617-776-1110.

Reader Service: Circle #405.

Apple Personal Diagnostics / Keep your Macintosh hale and hearty with this all-in-one utility.

CURSING THE HARDWARE GODS will do you no good when your Mac sputters and dies in the middle of a critical project, but you can prevent disaster from striking if you regularly use hardware- and software-diagnostic tools to spot and fix problems in your system.

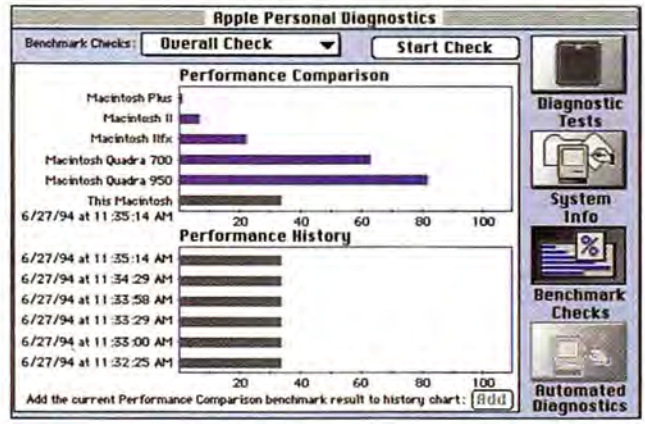
One of these diagnostic tools, Apple Computer's Apple Personal Diagnostics (APD), combines basic diagnostic and repair utilities in one easy-to-use application. A concise 102-page manual helps you interpret APD's reports. APD tests your hardware's performance; creates a profile of your system that lists all of your software, internal hardware, and SCSI devices; and repairs your directories on hard and floppy disks and SyQuest cartridges. It even includes a system extension that automatically launches and runs APD after startup or at a specified time.

Other diagnostic utilities don't have the breadth or diagnostic and repair capabilities that APD has, although they might specialize in areas that APD doesn't deal with. For instance, Symantec's Norton Utilities and Central Point Software's MacTools can repair your disk directory, as APD can, but they don't give you information on whether your FPU is crunching numbers as quickly as it should. If APD finds out that your Mac is acting sluggish because it's infected with the ZUC virus, you'll have to use an antiviral program such as Disinfectant to confirm that it has the ZUC virus and remove it. Likewise, you either need to figure out on your own why your system crashes or use an extension tester such as Casady & Greene's Conflict Catcher II.

Binary Medicine

APD runs a Mac through its paces, identifying all of its internal hardware for you. It checks the substructures on the logic board, making sure all components are in place and functioning. Next, APD runs a profile of the computer and tells you your Mac's processor type and speed; the amount of physical memory (RAM) you have; and whether you are using virtual memory and, if so, how much. APD also identifies NuBus cards, SCSI devices, and SCSI-ID numbers. Given this information, if you have any hardware problems, you can compare any anomalies with the clearly written and well-organized information in the manual. By doing so, you can cure some simple problems, such as SCSI-ID conflicts or improperly installed RAM, yourself.

APD charts the results of math-coprocessor, video-chip, and hard-drive speed tests, so you can compare current results with benchmark tests you've run previously on your Mac and with Mac Plus, II, IIfx, Quadra 700, and Quadra 950 benchmarks.



Find out how fast your Mac really is by using Apple Personal Diagnostics to compare its speed with that of other Macs.

In the Infirmary

We put ten Macs, five of which had known hardware and software problems, through APD's tests ten times each. Our five healthy machines came through with flying colors. When it came to identifying our ailing Macs' problems, APD missed only one intermittently occurring problem, which would probably have been found in subsequent tests.

APD found most of the Macs' maladies quickly. APD flagged a Mac Plus with an erratic floppy-disk drive for failing to format a test floppy disk. We used the APD emergency disk to repair the damaged hard-disk directory APD had diagnosed on a Mac Portable. APD had no trouble discovering that our Mac SE had a broken speaker, and it identified intermittently failing 1-MB SIMMs on a Mac IIcx. But even though it found a problem with a Mac II's FPU — it wouldn't process numeric calls — it didn't find the same machine's occasionally comatose PMMU (paged-memory-management unit). APD even accurately indicated that we were using RAM Doubler on one of the machines.

Any intermittent problem can be caught only with regular, repeated diagnoses. APD's automatic system extension is extremely useful for regular checkups (about once a week is fine), although we recommend running it when you don't usually use your Mac, since APD can take some time to give your computer its workout.

There are some things APD doesn't do. Unlike Norton Utilities, it can't repair disk problems while running on the problematic hard disk. It doesn't run on a Power Mac. And to emphasize the *Personal* in its name, it doesn't work over a network; it's designed for a stand-alone computer in a home or small business.

The Bottom Line

Although APD isn't a high-powered, complete tool that will cure all of your Mac's ailments, using it is a comfortable and convenient way to keep track of your machine's health and find problems before they cripple your Mac — and your projects. / Don Crabb

Apple Personal Diagnostics

Rating: ★★★★

List Price: $129.

Pros: Breadth of basic diagnostics for hardware and software. Easy to use. Good manual.

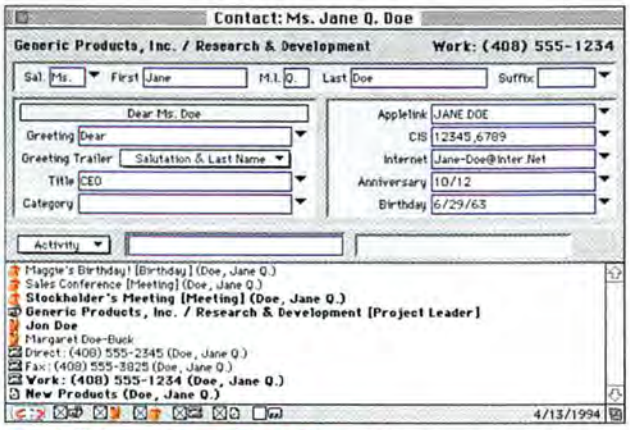
Cons: Doesn't work on a Power Mac or over a network.

Company: Apple Computer, Cupertino, CA; 800-769-2775 or 408-996-1010.

Reader Service: Circle #406.

Full Contact / FIT delivers powerful drag-and-drop contact and calendar management.

WITH SO MANY PIMS to choose from, why consider another? FIT Software thinks it has the answer with Full Contact, one of the newest kids on the PIM block. Full Contact gives you a slew of sophisticated features for managing your contacts and calendar events. It combines a relational-database engine with powerful drag-and-drop data-linking tools, so you can customize the program to manage information your way.



The Full Contact Detailed Editor window lets you see all the information related to a contact or calendar event. Note the five user-defined fields (right) and the list of linked items (bottom).

Hot Links

With Full Contact, your data is grouped into six basic categories: contacts, companies, addresses, phone numbers, activities, and notes. What makes the program so powerful is its ability to link an item stored in one category to any number of other items stored in other categories. That means you can have as many phone numbers or addresses as you want for a single company or contact. And you can link multiple contacts to a single calendar event. To link two items, you simply drag one item onto another (all links are bidirectional).

The SuperList for each category displays all the items in that category. Rows in the list represent items (contact names, for example), and columns represent fields (first name, last name, title). Full Contact lets you customize the list to display items the way you want to view them. For example, you can perform multilevel sorts that sort by two or more columns simultaneously.

Full Contact's linking features combine with powerful filters to let you search your data in a variety of ways. You can apply filters to SuperLists, for example, to view subsets of your lists. The package comes with a good selection of prebuilt filters, and you can create your own as well. And because filters know about links, you can filter one SuperList based on criteria from any other SuperList.

Double-clicking on an item in a SuperList calls up the Detailed Editor window, which lets you view all the information associated with an item, including descriptions of all linked items.

Full Contact is flexible when it comes to data entry. You can create new items in SuperLists and Detailed Editor windows, with the tool bar or with a Command-key combination. Helpful data-entry shortcuts include pop-up lists attached to fields — you can configure the lists to contain any number of commonly used entries — and automatic completion of entries as you type, based on information in the pop-up lists.

The tool bar and the icon bar let you quickly display and hide SuperLists and calendars, enter new items, dial phone numbers, import and export data, and delete items. The trouble is, both bars are floating palettes that get in the way of your SuperLists, obscuring useful information. So you're forced to opt for one of three rather undesirable solutions: constantly shuffling the palettes, alternately hiding and showing them, or allocating desktop space along the border of your screen for them.

Full Contact's calendar program provides all the basic features you need, including alarms and reminders, but none of the bells and whistles found in stand-alone calendar programs. There's also a basic telecommunications module and an integrated word processor with mail-merge capabilities.

Overall, we found Full Contact a powerful tool, but there's room for improvement. We'd like to see a visual cue in the calendar views that indicates completed activities. In the current version, the only way you can see which activities have been completed is in the list view. According to FIT, this will be remedied in a future release.

We'd also like a keyboard command for initiating phone dialing. The current method of dragging items to the Dialer button in the icon bar can be tedious, especially if you've opted to hide the bar and you have to call it up again.

Another complaint has to do with Full Contact's linking feature. When you delete an item, the program doesn't delete the items linked to it. Although you can select these items by using special filters and then delete them, the process takes time.

Last, Full Contact lacks quick-access modules that let you get to your contact and schedule data without launching the full application.

In addition to the 680x0 version, Full Contact also comes in a native PowerPC version, which we clocked at two to four times the speed of the 680x0 version.

The Bottom Line

Full Contact is a powerful, sophisticated PIM that lets *you* decide how to organize your contacts and appointments. The flip side of Full Contact's power, however, is a rather steep learning curve — plan to spend some time mastering the program's arsenal of features. / Jeffrey Sullivan

Full Contact 2.01

Rating: ★★★½

List Price: $169.

Pros: Tightly integrated contact and calendar management. Flexible, comprehensive data fields. Powerful yet simple data linking.

Cons: Complex feature set can be intimidating. Delete command doesn't affect linked items.

Company: FIT Software, Santa Clara, CA; 800-725-3734 or 408-562-5990.

Reader Service: Circle #407.

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Global Village OneWorld Fax / Network fax server is more than meets the eye.

TIRED OF WAITING IN LINE to send a fax? Check out Global Village's OneWorld Fax, a stand-alone fax server that makes sending faxes over a network as easy and painless as printing a document. And more features are planned for the very near future.

MacUser ZD LABS

Look, Ma — No CPU

The OneWorld Fax offers one big advantage over other network fax products — it doesn't require a dedicated computer. The package comprises software plus a hardware component that's smaller than a bread box. For $1,499, you get a box equipped with two Global Village PowerPort/Bronze II fax modems (the internal-modem configuration minimizes cable clutter), a 10BASE-T port, and a LocalTalk port. The $999 LocalTalk-only version includes one modem. Each version comes with a three-year warranty and a license for 30 users.

The OneWorld Fax server is a snap to install and use. Once it's up and running, the administration software lets network managers remotely change server names and zones, assign passwords to servers and to the OneWorld Manager application itself, and set up individual user accounts. Managers can opt to set up one account at a time or import the names of AppleShare, Shiva NetManager, or Global Village OneWorld server user lists. A special feature called passports lets groups of users share settings. Unfortunately, neither user lists nor passport settings can be synchronized across multiple OneWorld servers.

The OneWorld Fax software is easy to use. It works just like the stellar software that ships with Global Village modems, and it provides users with helpful feedback on the status of sent faxes.

There's more to the OneWorld Fax than meets the eye, however. The product is actually a full-fledged communications server that will add ARA and shared dial-out support to its current ability to send faxes as soon as Global Village completes the necessary software — probably sometime this fall, according to the company. Network managers will be able to download the new software to the server, using the Manager application.



A stand-alone network fax solution, Global Village's send-only OneWorld Fax doesn't require a dedicated computer.

The OneWorld Fax is a worthy first effort, but several challenges lie ahead for Global Village. The current product is well suited to small networks. To appeal to larger-network sites, however, the company will need to provide more ports per server, cross-platform support, and the ability to receive faxes. And when one fax is sent to multiple destinations, we'd also like the OneWorld Fax to speed the job by sharing it between modems.

The Bottom Line

With the introduction of the OneWorld Fax server, Global Village has successfully delivered a plug-and-play fax solution for small Mac networks. In the future, when the company unlocks the full potential of the product, network managers will gain a powerful multifunction communications server. / Mark Bieler

Global Village OneWorld Fax

Rating: ★★★½

List Price: Two-modem, two-port (LocalTalk and Ethernet) version, $1,499; one-modem, one-port (LocalTalk) version, $999.

Pros: Cost-effective network fax server. Upgradable through software.

Cons: Send-only fax capabilities. Can't share one fax sent to multiple destinations. Lacks cross-platform support.

Company: Global Village Communication, Mountain View, CA; 800-736-4821 or 415-390-8200.

Reader Service: Circle #408.

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CIRCLE 30 ON READER SERVICE CARD

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1080MB*	3.5"Half Ht.	$849	Internal $749	600MB	Tape Drive $789
1400MB*	3.5"Half Ht.	$999	Internal $939		
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2100MB	3.5"Full Ht.	$1399	Internal $1339		

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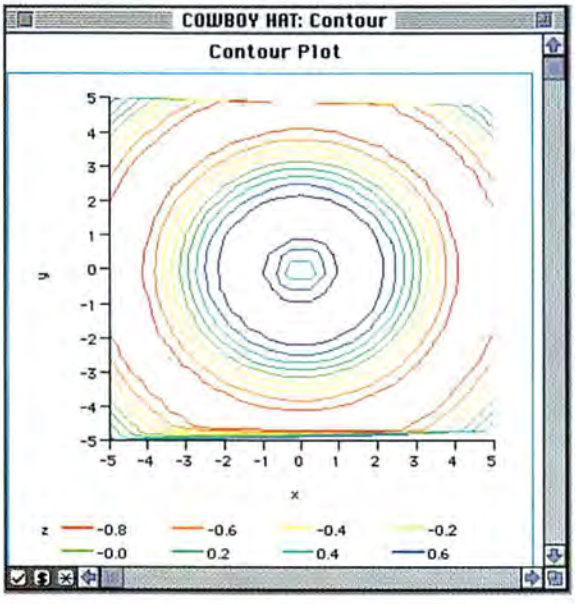
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JMP 3.0 / SAS teams enhanced plotting with industrial-strength number crunching.

STATISTICS SOFTWARE is taking advantage of the graphics power of today's computers by offering expanded plotting capabilities. One of the most powerful of these packages is SAS's newly upgraded JMP, which specializes in procedures best suited for industrial settings. (Although you can use JMP for general statistical analysis as well, doing so is like using a jet plane to take a trip to the corner grocery store.)

New Commands, Efficiency

JMP 3.0 incorporates the features of JMP Design, previously a separate product. The new version can automatically create tables of coefficients for a wide variety of experimental models, such as spun surface design, most of which are intended for industrial applications.



New kinds of plots, including contour plotting, are among the latest features added to JMP.

JMP's menus have four plot and analysis options that are new in this version: contour plots, ternary plots, cluster analysis, and survival analysis. Several options from previous versions' commands have additional power; for instance, Fit Y by X now includes stepwise regression and paired t-tests.

A host of enhancements expedite your analyses. For example, you can use the new magnifier tool to zoom in on selected areas of a plot. With the new Split Columns command, you can divide a column of data into separate columns, based on criteria specified in another column. And JMP supports QuickTime and AppleScript, so you can save a rotating spin plot as a movie or create your own macros.

A Visual Bounty

Above all else, JMP emphasizes visual display, using graphics even in situations in which most programs would be content with numerical tables. For instance, JMP uses comparison circles to indicate the extent of significant difference between pairs of groups. Other displays range from the usual — scatterplots and bar graphs — to the more esoteric, including spin plots and leverage plots.

With JMP, you select a design model instead of a particular analysis and the program determines the appropriate analyses for that design, typically providing several initial analyses and graphics and giving you options to modify the output or pursue other lines of analysis. You select from a variety of buttons and pop-up menus; your options vary, depending on the context of the present display. When this works well, you can interpret and visualize data in ways that you might never have considered otherwise.

Unfortunately, locating a particular option can be a minor hassle. You need to remember if you are searching for a button, a menu within the display window, an item from one of several pop-up menus placed along the border of the window, or a command from the menu bar.

Similarly, JMP makes the steps necessary for carrying out many statistical procedures unnecessarily obscure. For example, in simply trying to find the right commands and options, you can get bogged down in setting up a two-way analysis of variance, especially if you have a repeated measure. On the other hand, JMP has an excellent collection of specialized analyses, particularly for manufacturing (an analysis of production runs, for example).

Although JMP's manuals adequately describe the program's basic operations and include some excellent tutorials, they generally assume a lot of knowledge on the user's part when explaining why and how to use the more advanced statistical procedures. JMP also has some flaws when it comes to interactivity. Tables that are derived from an original set of data, such as tables of means, are saved as separate unlinked files. As a result, such tables are not updated when you change the original data.

The Bottom Line

Overall, fitting JMP into a particular category is hard. It is not a traditional hypothesis-testing program like StatView, although it can do most of the same kinds of analyses. It is not a comprehensive mainframe clone like Systat, but it offers a wealth of high-end statistical procedures. And whereas JMP's approach to analysis resembles that of exploratory-data-analysis programs such as Data Desk, JMP doesn't have quite the same emphasis on interactive links between graphs and tables.

Users in industrial settings who are already familiar with JMP's more specialized statistics will relish the program's abundant range of analyses and flexible display options and find 3.0 a great improvement. But less demanding users will find JMP more difficult than worthwhile. Our advice: look carefully before you take the leap to JMP.

/ Ted Landau

JMP 3.0

Rating: ★★★½

List Price: $695; upgrade from 2.0, $136.50.

Pros: Wide variety of interactive visual displays. Many advanced statistical procedures.

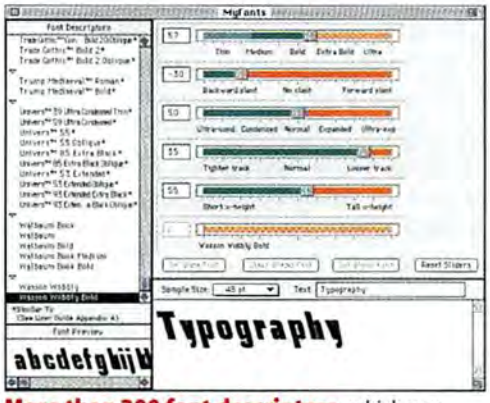
Cons: Particular procedures or options difficult to find. Insufficient documentation.

Company: SAS Institute, Cary, NC; 919-677-8000; 919-677-8166 (fax).

Reader Service: Circle #409.

FontChameleon / Innovative font tool puts a font factory in your Mac.

BUILDING A VARIED FONT collection is important to most Mac users, but fonts, unfortunately, tend to gobble up disk space and dollars. The typography mavens at Ares Software have addressed this problem with FontChameleon, a slick program that offers you hundreds of customizable fonts for less than $300 — and they won't absorb every free kilobyte on your hard disk.



More than 200 font descriptors, which you can modify and transform into real fonts, ship in FontChameleon.

Changeable Font Faces

FontChameleon is a font factory similar in purpose to Adobe's multiple-master technology. Font descriptors, which Ares likens to recipes for creating fonts, transform the program's single master-outline font into PostScript or TrueType fonts resembling popular (read *Adobe*) commercial faces. FontChameleon ships with more than 200 font descriptors that mimic a wide range of well-known faces: from Aachen Bold to Univers and Berthold Walbaum Book. The whole package takes up about 2 MB of hard-disk space and works with System 6.0.7 or later. Opening a font descriptor and generating a font only takes a minute or so.

You can also create your own font descriptors. They have to be based on one of the supplied descriptors, but you can fashion an entirely new look by manipulating various aspects of a descriptor. The fonts created from these descriptors are fully hinted but lack kerning pairs. You can, however, import AFM (Adobe Font Metrics) files (available from many on-line services), which ensure that your font has identical metrics and kerning pairs as the corresponding Adobe version. You can also create font descriptors based on blends between two descriptors.

Once you've created a font descriptor, you generate either PostScript or TrueType font files, which you can install on a Mac or on a Windows computer. And you can trade the cross-platform font-descriptor files around as well. At about 2K each, they offer an easy way for people with FontChameleon to exchange fonts without dealing with bulky screen and printer fonts.

Font Failings

The main failing you'll notice in FontChameleon is that it offers no true italics — a rather startling omission in a product aimed partly at professionals. You can apply slant within any font descriptor to create faux italics, but it's just not the same (Ares claims support for true italics will come by the time you read this). Also missing are pi and novelty fonts.

The documentation, although adequate, was missing the index listed in the table of contents.

The Bottom Line

FontChameleon offers a good glimpse at the future of fonts. The product suffers from a rush to market (missing italics and some documentation oversights), and it does limit you to body and display faces — but even in its current form, it makes for a wonderful playground in which to satisfy your font fantasies without fear of insolvency. / Gregory Wasson

FontChameleon 1.0.1

Rating: ❦❦❦

List Price: $295.

Pros: Great font product for users with limited hard-disk space. Relatively inexpensive. TrueType support.

Cons: Lacks support for true italic fonts. No pi or novelty fonts.

Company: Ares Software, Foster City, CA; 800-783-2737 or 415-578-9090; 415-378-8999 (fax).

Reader Service: Circle #410.

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GOLD DISK

CIRCLE **25** ON READER SERVICE CARD

Apple Multiple Scan 17 Display and Nokia Multigraph 447X / Two new monitors give you the big picture.

AIMED AT general-business users, two new 17-inch monitors boast multifrequency capabilities and state-of-the-art Trinitron tubes. The $1,069 Apple Multiple Scan 17 Display offers a sharp, bright picture and includes convenient system-software controls. Just as sharp but even brighter at the standard resolution, the $1,250 Nokia Multigraph 447X features higher resolutions than the Apple monitor does and offers Nokia's easy-to-use on-screen controls for fine-tuning the display.

MacUser ZD LABS



Sharp and bright, the Apple Multiple Scan 17 Display (right) and the Nokia Multigraph 447X offer solid image quality and handy software controls. The Nokia monitor is brighter and supports higher resolutions than Apple's monitor, but it's not quite as sharp as the Apple monitor at 1,024 x 768 pixels.

Apple Multiple Scan 17 Display

Apple's latest monitor replaces the company's 16-inch model, whose only resolution is 832 x 624 pixels (the standard for 16- and 17-inch monitors). The Multiple Scan 17 Display offers resolutions of 640 x 480 pixels and 1,024 x 768 pixels in addition to the standard 832 x 624 pixels and supports resolutions ranging from 640 x 480 pixels to 1,280 x 1,024 pixels for PCs.

If you own a Quadra, Centris, or Power Mac or use a Mac Display Card 24AC or one of several supported third-party video cards, you can use software controls to switch resolutions without restarting your computer (to do so, you need System 7.1 or later). Switching resolutions is a snap — simply select a setting in the Mac's Monitors control panel. If you own a Mac II, an LC, or an older Mac video card, you'll have to purchase a special cable adapter to use the Multiple Scan 17 Display and, unfortunately, you won't be able to use software to switch resolutions.

The Multiple Scan 17 Display's physical control panel comprises five buttons and five LED indicators that let you adjust contrast, brightness, picture size and position, convergence, pincushioning, screen rotation, and color temperature.

The Multiple Scan 17 Display is Energy Star-compliant and features Apple's programmable Energy Saver control panel, which tells your Mac to power the monitor down after a specified period of CPU inactivity. With energy saving enabled, we found that the monitor used less than 5 watts. Maximum power consumption without energy saving was 100 watts.

Nokia Multigraph 447X

At the standard resolution of 832 x 624 pixels, we found the Nokia Multigraph 447X as sharp as the Apple Multiple Scan 17 Display but noticeably brighter. The Multigraph 447X also supports higher resolutions than the Apple monitor — as high as 1,152 x 870 pixels for Macs and as high as 1,600 x 1,200 pixels for PCs. In our subjective tests, however, we found the Multigraph 447X's image quality not quite as sharp as the Apple monitor's at 1,024 x 768 pixels.

The Nokia monitor's one slight drawback is the cable adapter that ships with it, which limits resolution to 832 x 624 pixels. If you want to take advantage of the monitor's higher resolutions, you have to send for a special multiresolution cable adapter that Nokia provides free of charge. The adapter is configured with switches and a dial that you can set to one of a variety of Mac resolutions.

If you're really fussy about your monitor's image, you'll appreciate the special software controls Nokia provides within the monitor's ROM (this is not system software, folks). The software displays a pop-up menu with a slew of settings that let you tweak your display. As you make adjustments, a bar graph and numerical scale show you how far you've deviated from the factory default settings.

Like the Apple Multiple Scan 17 Display, the Multigraph 447X is also Energy Star-compliant. Although Nokia doesn't supply an energy-saving utility for the Mac, we were able to use Apple's energy-saving software with the Multigraph 447X. In energy-saving mode, the Multigraph 447X's power consumption was about 7 watts; maximum power consumption without energy saving was 124 watts.

Put to the Test

To evaluate the capabilities of the Multiple Scan 17 Display and the Multigraph 447X, we subjected each to the same suite of tests we used for our June monitor roundup (see "Big-Screen Bargains," June '94, page 82) and compared the results with those of the Sony Multiscan CPD-1730, the top-rated 17-inch monitor in that roundup. We used the VRAM video board in a Power Mac 7100 and set the resolution at 832 x 624 pixels.

The Minolta Color Analyzer CA-100 test confirmed that the Multigraph 447X is indeed brighter than the Multiple Scan 17 Display, although neither the Apple nor the Nokia monitor was able to match the brightness of the Sony Multiscan CPD-1730. The brightness of the Apple and Nokia monitors was exceptional, however, and both surpassed the Sony monitor in sharpness by a fairly wide margin. On the misconvergence tests, the Nokia and Sony monitors performed very well, but Apple's monitor suffered somewhat from a misconvergence problem in the lower left corner of the screen. The Apple monitor had less pincushion error than either the Sony or the

Nokia monitor, however.

We also performed a subset of the MPR II tests on the Nokia and Apple monitors. (MPR II is one of two industry standards for monitor emissions.) Both monitors claim MPR II compliance, and each passed our tests. If you're willing to pay an extra $225, you can buy a special Multigraph 447X model that meets the more stringent TCO emissions standards.

The Bottom Line

If you don't need resolutions higher than 1,024 x 768 pixels, the $1,069 Apple Multiple Scan 17 Display is a good buy. Image quality is sharp and bright at all three of the monitor's supported resolutions. An added plus is Apple's convenient monitor-control software, which lets you switch resolutions without restarting your Mac.

If you can take advantage of the higher 1,152-x-870-pixel resolution on a 17-inch monitor, you won't be disappointed with the $1,250 Nokia Multigraph 447X. Although the Nokia monitor loses some of its sharpness at higher resolutions (most monitors do), its display is sharp and bright at the 17-inch standard resolution of 832 x 624 pixels. Nokia's three-year warranty, compared to Apple's one-year warranty, is icing on the cake. / Stephen Chan

Apple Multiple Scan 17 Display

Rating: ★★★★

List Price: $1,069.

Pros: Good image quality. Convenient software controls for resolution switching and energy saving.

Cons: Maximum Mac resolution of 1,024 x 768 pixels.

Company: Apple Computer, Cupertino, CA; 800-538-9696, ext. 525, or 408-996-1010.

Reader Service: Circle #411.

Nokia Multigraph 447X

Rating: ★★★★

List Price: $1,250.

Pros: Bright picture. High-resolution capabilities. Fine-tuning software controls. Three-year warranty.

Cons: Not as sharp as the Apple Multiple Scan 17 Display at 1,024 x 768 pixels. Multiresolution adapter not included (available on request).

Company: Nokia Display Products, Sausalito, CA; 800-296-6542 or 415-331-0322.

Reader Service: Circle #412.

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CIRCLE **32** ON READER SERVICE CARD

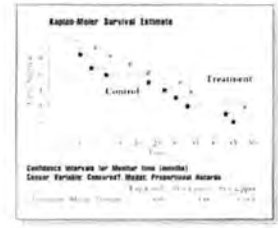
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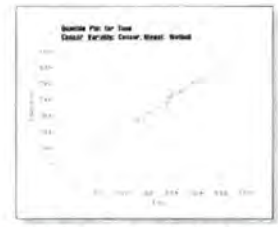
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CIRCLE **168** ON READER SERVICE CARD

MacUser
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LEARNING ABOUT CHILDREN'S EDUCATIONAL SOFTWARE

Just in time for the holidays, MacUser presents a guide to buying children's educational software. This guide focuses on software that teaches creativity and exploration skills, as well as math and reading skills. Written for parents who want to buy the best for their children... need to know what to look for... and where to find it. These answers and more can be found, every month, in MacUser.

CD-ROM DRIVES AND DRIVERS

This December, MacUser takes a serious look at 30 double-, triple- and quad-speed CD-ROM units. Should you buy the drives that Apple bundles with the new Macs, or should you by from a third party? Anyone who wants to get into this exciting new technology can start by getting into MacUser.

SERVING POWER MAC SERVERS

In this Labs review, all of Apple's servers are compared, measuring price and performance. From the 68K models to the new Power Mac servers, the experts deliver bottom-line advice for buyers. This December, MacUser serves up all the latest news on servers.

DECEMBER AD CLOSE:
TUESDAY,
SEPTEMBER 27TH, 1994

Radar 4.0 / Keep your AppleTalk network in hand with Sonic Systems' versatile tool.

SONIC SYSTEMS' RADAR is a tool that most AppleTalk-network managers won't want to be without. Radar scans networks, collects configuration data on each node, and alerts you to trouble spots. You can also use it to control a host of network-related activities, including managing printers and updating and installing software. New with version 4.0 are welcome improvements in Radar's scripting facilities, which make it easier than ever to automate network-management tasks.

MacUser ZD LABS

Window on the Network

Once you've installed the Radar Responder control panel on each Mac on your network, Radar can begin scanning and gathering configuration information. As network administrator, you can view the network in one of two windows — the Main Device window and the Topology window. The Main Device window displays a list of all the Responder-equipped devices and network printers in a selected zone. To call up a window containing detailed configuration information on one of the listed items, you simply double-click on its name.

If you've selected a Mac on the network, you'll get a User Details window with 12 control buttons that let you view various aspects of the selected Mac's system configuration. Also available are buttons for updating the information in the window, changing Responder passwords, and setting alarms for the node.

The User Details window displays just about everything you need to know about the Mac you've selected. In addition to standard hardware specifications (processor type, FPU type, ROM version, Ethernet address, and so on), you can view data about the Mac's video adapters and resolution settings, NuBus cards, SCSI peripherals, mounted volumes, applications and files stored on mounted volumes, system-software configuration, extensions, control panels, and fonts and DAs. You can also add your own information — user name, phone number, location, and any notes you want to make.

If it's a printer you're investigating, you'll use the Printer Details window, which lets you check on the printer's status, download PostScript files, rename or restart the printer, download or remove fonts to memory or to disk, and format the printer's hard disk.



Radar retrieves detailed information on the Macs, printers, and other devices on your AppleTalk network.

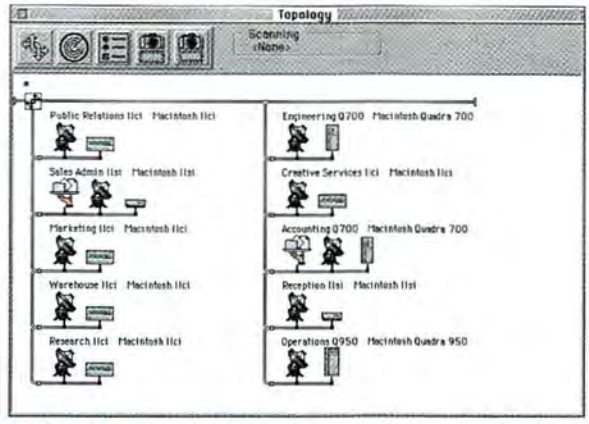
Red Alert

We found Radar especially effective for managing a large network. From within the User Details window, you can set alarms that alert you when a node or network service appears or goes down. You can also use alarms to manage printer problems such as paper jams or exhausted paper supplies.

When your network runs into a problem, Radar can alert you in one of several ways. If you're running the application in the foreground, Radar displays an on-screen alert dialog box and highlights the problem node in the Topology window. If you're running Radar in the background, you'll see the Radar icon flashing on top of the Apple-menu

icon. If you've selected the Report to Log option, Radar will send information on the problem to the Radar Log.

You can also opt for an alert from an alphanumeric pager or from e-mail. Pager-alarm notification is provided by Ex Machina's Notify! software, an Apple-events-based personal paging system, or by Caravelle Networks' Pager Pro. E-mail alarms are provided by QuickMail servers — you'll need to install the QuickMessenger extension on your machine to take advantage of this feature. The extension is provided on the Radar disk, but you must purchase the Notify! and Pager Pro software separately.



Radar's Topology window gives you an overview of your entire network.

To move from node-specific information to an overview of your entire network, you select Radar's Topology window, which displays a graphical map of all the devices on your network by zone. Each node is represented by a separate icon and is labeled according to the machine's model type and responder-ID number. Additional icons represent active software for the node, including AppleShare, QuickMail, and file sharing. By double-clicking on a node icon, you can view its corresponding Details window.

From within the Topology window, Radar also gives you options for modifying the graphical display of your network — a handy feature if you're trying to view a large network. For example, you can change the number and spacing of the display columns so that icons are closer together. You can also print the topology view or save it as a PICT file.

Stick to the Script

In version 4.0, Radar features vastly improved scripting facilities. You can quickly create complex scripts that gather information from multiple nodes or perform network actions on more than one machine. What makes the scripts so easy to create is Radar's prebuilt settings, which you select and combine to build the scripts. Scripts can automate tasks such as installing software (applications as well as system components), starting and shutting down machines, and sending messages.

You can also use scripts to generate reports, which you can display on-screen, print, or send to a QuickMail mailbox. Scripts can also execute actions based on conditional statements, so you can create sophisticated selection criteria for network actions. To minimize the impact on network traffic and user efficiency, Radar lets you schedule your scripts to run in off hours.

Radar is an invaluable tool for network management, but it won't suit your needs if you're overseeing a mixed-platform network. Radar works with AppleTalk or EtherTalk networks only. For cross-platform network management, check out TechWorks' GraceLAN Pro Series of network-management tools (see the review of GraceLAN Network Manager 3.0, April '94, page 68).

The Bottom Line

We give Radar high marks as an excellent AppleTalk-network-management tool. Most noteworthy in the latest release are Radar's more powerful scripting facilities, which let you quickly and easily build complex scripts to automate a variety of network-management tasks. / David Kison

Radar 4.0

Rating: ★★★★½

List Price: $499 per administrator (Responder freely distributable).

Pros: Robust scripting facilities.

Cons: No cross-platform capability.

Company: Sonic Systems, Sunnyvale, CA; 800-535-0725 or 408-736-1900.

Reader Service: Circle #413.



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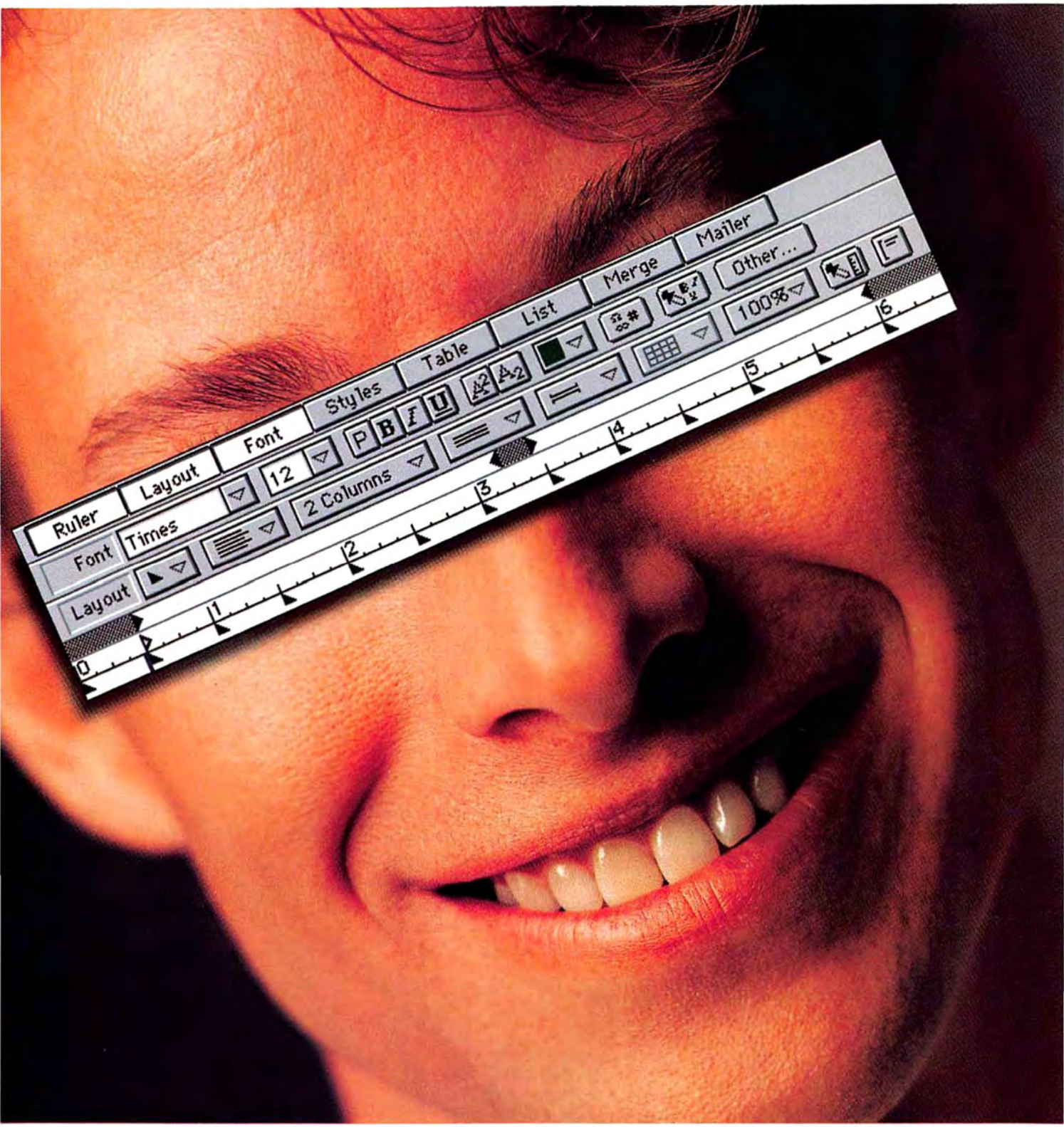
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Vistapro / Creating your own digital terrain

DIGITAL-FRONTIER PIONEERS often have to create their own virtual worlds. Vistapro, a world-building tool from Virtual Reality Laboratories, combines fuzzy logic, artificial intelligence, and fractal numbers to create digital landscapes. And, as that last sentence implies, it's no walk in the park to create a digital walk in the park.

Terrific Terrain. Vistapro uses U.S. Geological Survey Digital Elevation Mapping (DEM) files for its terrain data. The program comes with 20 DEM files, from Mount St. Helens to the caldera of Olympus Mons; additional sets are available for $35 each. You can also use gray-scale PICT documents to generate terrain elevations or use Vistapro's built-in fractal-terrain generator to create over four billion landscapes.

Once you've set down the basic lay of the land, you can define such parameters as snow and tree lines and the relative concentration of four classes of vegetation (pine, oak, and palm trees and cactus). Water sources are divided into lakes (which fill the landscape to an elevation you determine) and rivers (which flow from an origin point downhill until they reach a lake or another river). Water boundaries are set by the topology of the landscape. In the sky, Vistapro also allows you to create cloud formations, atmospheric haze, and even stars.



After you have created the landscape and all of the elements in it, you can either select a predefined color scheme for your world or define your own color scheme.

In Your Own World. And finally, when everything's perfect, you can position cameras that let you view your world. You set the size, detail, and texture level at which you want to view your world, create a simple fly-through animation, and save the renderings as PICT files or export the landscapes as DXF files for importing into 3-D-modeling packages.

Unfortunately, none of this is especially easy to do. The program is hindered by a somewhat unwieldy interface (for example, there's no way to close a DEM file except to quit Vistapro). Version 1.0 was also unable to correctly save PICT files on Power Macs; a bug fix and a native PowerPC upgrade should be available by the time you read this.

Although its results are impressive — from nearly photo-realistic vistas of familiar territories to surreal views of never-before-seen worlds — Vistapro has a steep learning curve that may put off all but the most hard-core digital explorers. / Jeffrey Sullivan

Vistapro 1.0 ★★★ / **List Price:** $89.95. **Company:** Virtual Reality Laboratories, San Luis Obispo, CA; 800-829-8754 or 805-545-8515. **Reader Service:** Circle #414.



Tree Professional / Grow your own arboretum

LIKE A VIRTUAL Johnny Appleseed scattering realistic trees throughout your digital scenery, Tree Professional, from Onyx Computing, generates deciduous and evergreen trees that you can then use in 3-D animations and in architectural renderings.

Digital Seeding. Tree Professional gives you a phenomenal amount of control over the trees you create. You can specify details such as the height, thickness, and twist of the trunk; the density and angle of the boughs and branches; and the number and color of leaves and flowers. You can save your settings for later use or use a seed tool to generate variations of the same tree.

You can export the 2-D trees Tree Professional creates in DXF format for rendering in a 3-D-graphics program. You can omit some of the eight available layers, such as twigs and leaf stems, to render trees more quickly, although less realistically.

Tree Professional is copy-protected and comes with only 5 predefined trees. We think many users, especially those using Tree Professional for landscape design, will need the $129 optional tree library, which has 50 predefined trees (33 broad-leaved and 17 conifer), including magnolias, Douglas firs, maples, poplars, lindens, and weeping willows.

For those who need realistic trees quickly, Tree Professional creates a breath of fresh air in a digital world. / Sean Wagstaff

Tree Professional 1.1 ★★★½ / **List Price:** $395; tree library, $129. **Company:** Onyx Computing, Cambridge, MA; 617-876-3876. **Reader Service:** Circle #415.

Where in Space is Carmen Sandiego? Celestial sleuthing

ATTENTION, BUDDING DETECTIVES! Carmen Sandiego, the infamous star of Brøderbund's Carmen series of educational games, has struck again. Carmen has assembled a new gang of bandits and has headed for space. Children 12 and older must track the elusive Ms. Sandiego and her spacey sidekicks while they try to steal everything from Saturn's rings to the winged sandals of Mercury.

Like the previous titles, Where in Space is Carmen Sandiego? has the player in the role of an Acme detective whose advancement within the agency depends on apprehending Carmen's creeps. The player must pay close attention to tips from witnesses and informants and try to decode V.I.L.E. messages for hints on where crooks such as Verna-Lee Kwinox and Astro Fizzix may go next.

Star Search. A word of warning for novice astronomers: This game is considerably tougher than its predecessors. Fortunately, for those who are not well versed in the planets and stars, there's the VAL 9000, a database filled with trivia and facts about the planets, moons, and constellations. Brøderbund has also included *Peterson's First Guide to Astronomy* in the package, but accessing the VAL 9000 database is much quicker and easier.



The series' approach toward learning, coupled with the characteristic Carmen sense of humor, makes this game a tough one to beat. / Kristin Mellone

Where in Space is Carmen Sandiego? ★★★★½ / **List Price:** $50. **Company:** Brøderbund Software, Novato, CA; 800-521-6263 or 415-382-4400. **Reader Service:** Circle #416.

Crystal Ball 3.0 / Excel add-in provides intelligent risk analysis

FOR THOSE WHO USE SPREADSHEET MODELS to help them make business decisions, Crystal Ball will add a whole new dimension to the process.

Using this risk-analysis add-in module for Excel 4.0, all you need to do is the following: define probability distributions for uncertain variables; determine which cells you want forecast; and set a number of trials, usually in the hundreds of thousands.



Crystal Ball does the rest for you: It plugs in random numbers for each variable conforming to the distributions you defined, calculates outcomes, and then plots the results on a frequency-distribution chart that enables you to see the probability of any range of results. For instance, you might define probability distributions for Social Security benefits and life expectancy, forecast your retirement income, and find out that there is a 25-percent chance that your retirement income will be less than $10,000 a year.

Integrated Intuition. Crystal Ball 3.0 is a major upgrade that works differently from its predecessor. Formerly, you were required to export your spreadsheet in SYLK format and then import it into Crystal Ball for analysis. This new version of Crystal Ball is an integrated add-in module for Excel and takes advantage of Excel's broad array of functions and faster calculation engine.

Another significant new feature is the Sensitivity Chart, which ranks assumptions according to the influence they have on model outcomes. You can now find out whether life expectancy or Social Security benefits are more important when you determine your probable retirement income.

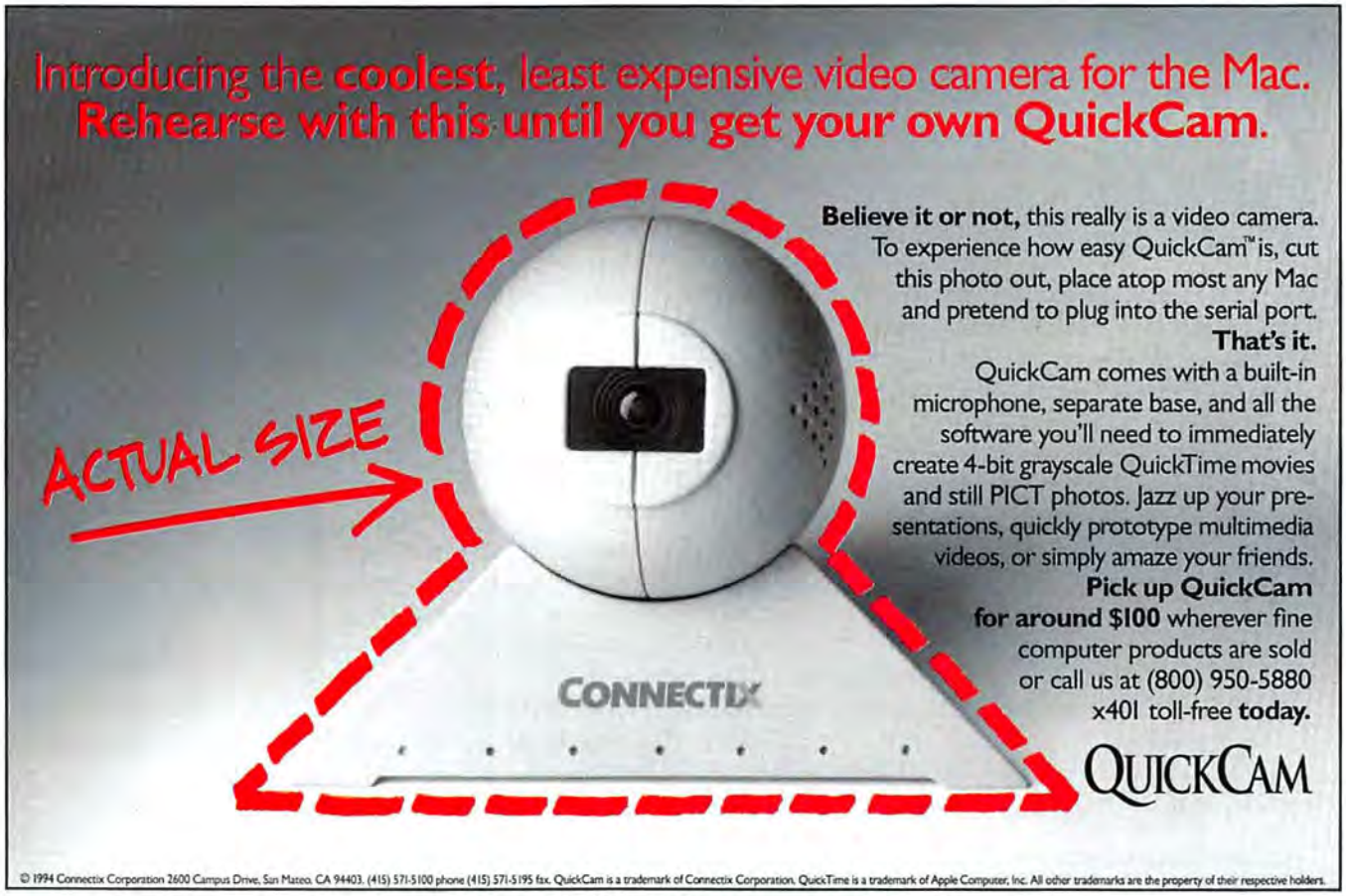
A drawback is that you need to allocate at least 5 MB of RAM to Excel in order to accommodate Crystal Ball; you could also use virtual memory, but doing this slows down the calculation time significantly.

Knowledge-Based Foresight. Although Crystal Ball is easy to use, has a large array of features and reporting options, and is generally an impeccable implementation of a popular decision-making technique, we have to invoke the garbage-in, garbage-out maxim. Crystal Ball's results are only as good as the information on which they are based.

The documentation is excellent, even though it was written for Windows and the Macintosh version has only a slim supplement. The dizzying gallery of probability distributions, from Normal and Binomial to Pareto and Gamma, is thoroughly explained in the manual.

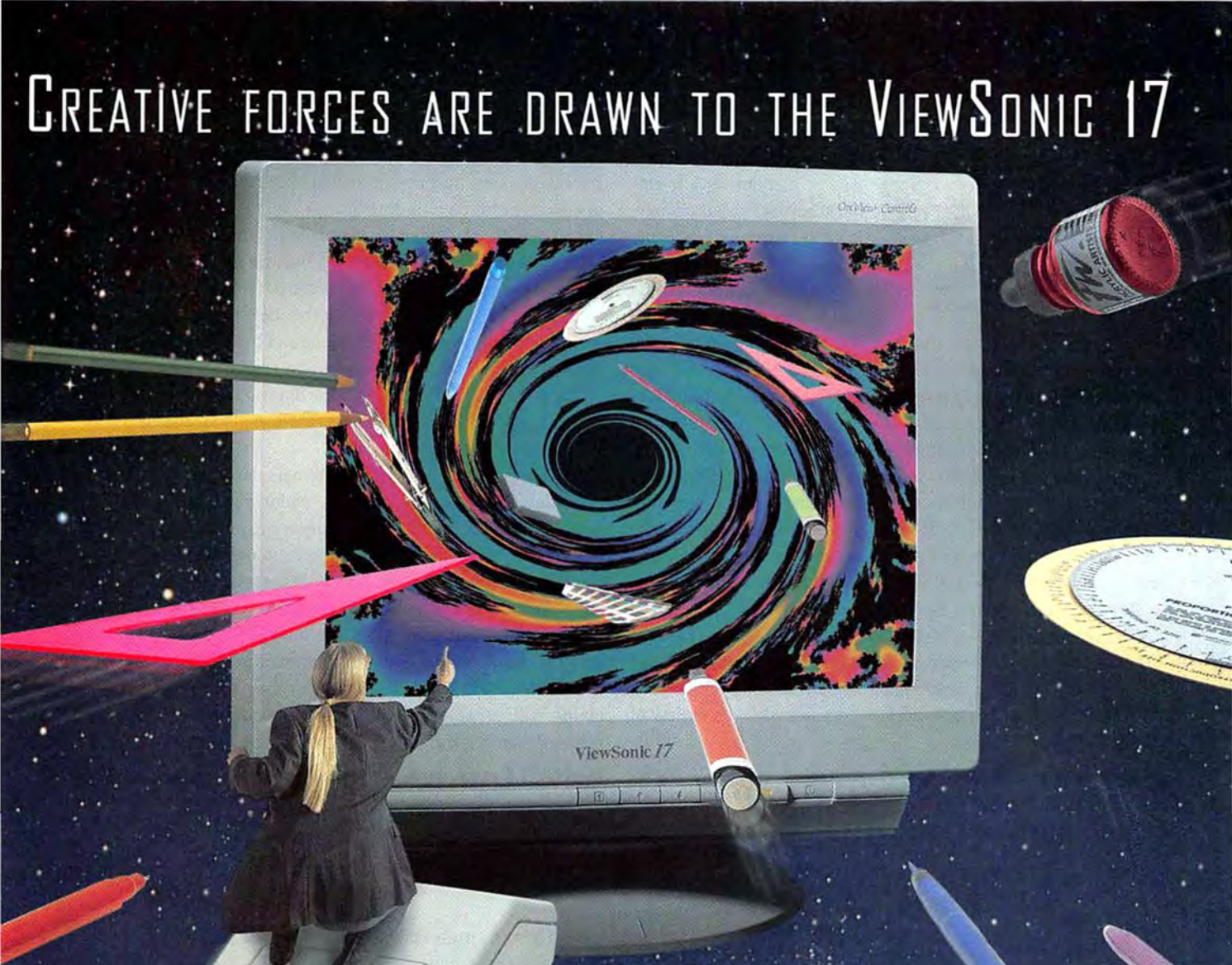
For those who are comfortable with spreadsheet models and statistics, or are willing to learn, Crystal Ball is a top-notch decision maker's tool. / Becky Waring

Crystal Ball 3.0 ★★★★ / **List Price:** $295. **Company:** Decisioneering, Denver, CO; 303-534-2291. **Reader Service:** Circle #417.



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The ViewSonic 17 is even equipped with BNC connectors, which allows two systems to be attached to the monitor at the same time. As a matter of fact, the entire line of ViewSonic's 15- through 21-inch New Generation monitors is MAC and PC compatible, and meet Swedish MPR-II standards for low radiation.

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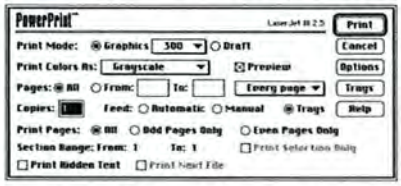


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PowerPrint / Use that PC printer

STUCK WITH YOUR POWERBOOK in a hotel with only PC-compatible printers? Want to buy a less expensive printer that doesn't support the Mac? Call on PowerPrint to solve your problems.



PowerPrint is a collection of about 20 printer drivers that allows you to print from any Mac to more than 1,000 laser, inkjet, and dot-matrix PC printers. A chart in the manual helps you decide which driver to install, and GDT Softworks even includes a printer cable in the package.

Everything You Need. Printing options differ from driver to driver, but you can generally control resolution, fractional widths, scaling, and tray selection. Control over bidirectional printing, gaps between tractor-fed pages, draft mode, and duplex printing depends on what printer you're using. Each driver has a print-preview feature, and background printing is supported by the SpoolMaster utility.

The PowerPrint drivers do work quite well but don't necessarily let you access each feature of your printer. For example, the LaserJet III driver we had to use with an Okidata OL810 laser printer didn't let us use the printer's image-enhancement technology. Otherwise, though, PowerPrint's drivers performed flawlessly on a variety of printers. / Gregory Wasson

PowerPrint ♦♦♦♦ / **List Price:** $149. **Company:** GDT Softworks, Burnaby, BC, Canada; 800-663-6222 or 604-291-9121. **Reader Service:** Circle #418.

Dynodex 3.5 / Finding contacts faster

BUILDING ON THE LOYALTY of an established customer base, Dynodex has one major addition that will make its modest upgrade price worthwhile: a pull-down-menu icon that allows you to view names and phone numbers instantly from within any application.

The most significant addition to Dynodex 3.5 is Dynofind. This control panel places an icon in the menu bar that lets you search the contacts in any one Dynodex file. The matching contacts appear with their phone numbers (which Dynodex can dial for you) and addresses (which Dynodex can copy to the Clipboard for you).

The contact views haven't changed. But you can now change fonts and column widths in your views. You can also sort and reorder fields from within the List view.

Dynodex's support for printing remains excellent. And besides providing predefined templates for phone books and correspondence, Dynodex makes creating your own easier than in the previous version: Select the fields you want and the order in which you want them to appear, and Dynodex does the rest. Also, Dynodex now supports links to Portfolio's Dyno Notepad outliner and to-do-list manager (an upgrade of Acta 7 outliner). When linked with the Dyno Notepad, contact notes have an unlimited number of pages.

Dynodex 3.5 is a slick, fast contact manager that focuses on usability. With the addition of Dynofind, Dynodex is even faster at its key function: helping you get your work done. / Jeffrey Sullivan

Dynodex 3.5 ♦♦♦♦ / **List Price:** $69.95 (upgrade, $29.95). **Company:** Portfolio, Richmond, VT; 800-729-3966 or 802-434-6400. **Reader Service:** Circle #419.



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CIRCLE 63 ON READER SERVICE CARD



cypherPAD / Low-priced security for crowded offices

BUSINESSES WITH crowded offices and small budgets can secure their data, even if several people share the same computer, with the inexpensive cypherPAD. cypherPAD works with all Macs running System 6 or 7, and since it installs itself at the driver level, no one can get at data without the correct password, even if the computer is booted from a floppy disk, an external hard disk, or any other medium.

Peeking Eyes. Crowded offices will like several of cypherPAD's unique features. The program can support as many as 16 users with individual passwords sharing the same computer. An on-screen letter keypad for entering passwords makes it hard for shoulder surfers to guess your password; the keys on the keypad scramble each time you select a letter. We found hunting for letters so tedious, however, that we quickly reverted to using the keyboard for password entry.

You have to make some allowances because of cypherPAD's low price. cypherPAD can't lock individual files and folders on a hard disk, so if several users are sharing a computer, they will have unlimited access to all files once they've logged in. When only an external drive is locked, the sign-on dialog box asks for a password twice.

cypherPAD has its appeal when security is a larger concern than privacy and when cost is a major factor. / Patty Ames

cypherPAD 1.213 ★★★ / **List Price:** $49. **Company:** usrEZ Software, Irvine, CA; 714-756-5140. **Reader Service:** Circle #420.

ClickBook / Book registration

CREATING YOUR OWN pamphlets, newsletters, and brochures is a cinch with a Mac, but printing them in book format is much trickier, particularly if you have unusual layouts, such as trifold brochures. That is, unless you have ClickBook, an easy-to-use control panel that can create books out of your documents.

Simply Done. ClickBook's most outstanding feature is simplicity. You tell ClickBook what type of printer you have and select a layout, and the program resizes the type and graphics from your documents to fit your book's layout.



ClickBook includes 20 popular layouts, including a folded horizontal flip book and a four-up book, with pages varying from credit-card size to legal size. Once all the pages are printed, ClickBook prints out clear directions on which way to position the pages to print the reverse sides and where to cut and fold.

Mix-and-Match Programs. You can include documents created in various programs in one book; unfortunately, if you do so, ClickBook can't keep track of printed page numbers, a flaw BookMaker says it will fix in its next release. We also found that ClickBook doesn't always work with QuarkXPress; if preserving your formatting is crucial, you may want to stick with a page-layout program.

If you need a fast and easy way to get a newsletter out, using your printer, ClickBook is just what you need. / Nancy Peterson

ClickBook for the Macintosh 1.1 ★★★★ / **List Price:** $69.95. **Company:** BookMaker, Palo Alto, CA; 415-354-8160. **Reader Service:** Circle #421.

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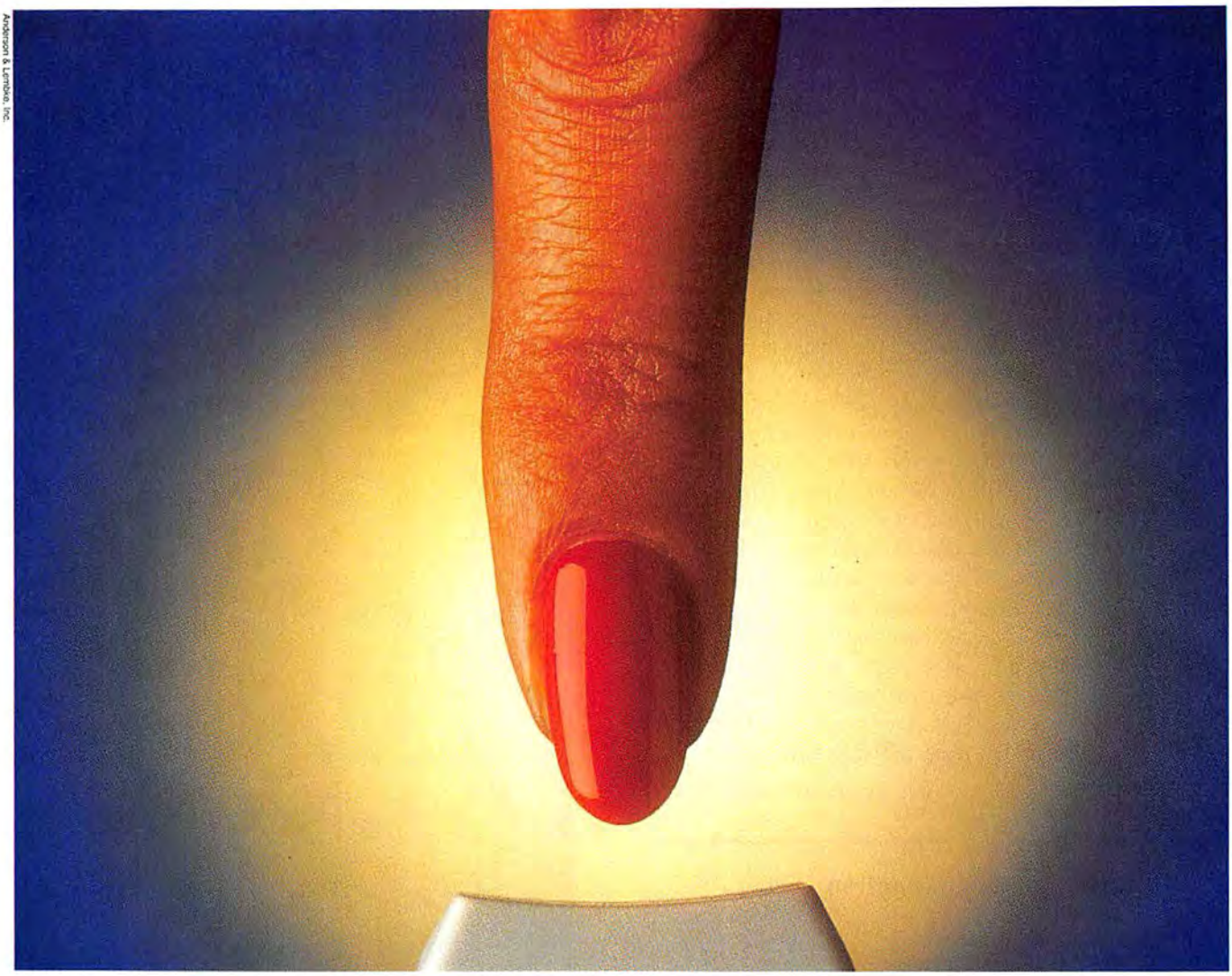
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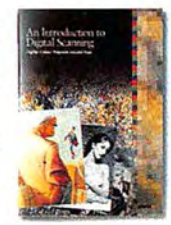
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PowerMerge 2.0

Powerful file synchronization

DO YOU WANT to synchronize all but one file in a folder? Do you want one version of a file on your desktop Mac to always match the version on your PowerBook, even if it is the older file? PowerMerge can probably handle it.

Synchronization Deluxe. A full-featured program before, in its current version PowerMerge can track relocated, deleted, and even renamed files. You can designate one Mac hard disk as the master, which turns the hard disk of a second, companion Mac into a clone of the first. If you have a pair of text documents, PowerMerge can compare them on-screen and highlight how they're different.

PowerMerge has always transcended most of its competitors with its ability to list on-screen each file it is tracking, complete with the file's current synchronized status. Unfortunately, this on-screen list tends to be confusing, with a multitude of similar-looking icons with different meanings and a listing that makes it hard to tell which files are on only one of the computers.

Feature Glut. We would gladly sacrifice some of PowerMerge's more esoteric options, such as its text comparisons and its ability to update by file-creator type, for a simpler, easier-to-understand interface and a more thorough manual. / Ted Landau

PowerMerge 2.0 ★★★ / **List Price:** $129. **Company:** Leader Technologies, Newport Beach, CA; 714-757-1787. **Reader Service:** Circle #422.

Spaceway 2000 / Speeding through the future's freeway

GETTING TO WORK is a hair-raising adventure when you're an impatient commuter on the intergalactic Spaceway 2000 in Casady & Greene's latest arcade game.

Perilous Passage. In this game, you race your spaceship down the seemingly endless spaceway, avoiding or gunning down obstacles such as asteroids, alien gunboats, enemy mines, and wall creepers that hug the guardrails of the spaceway and take potshots at you. To aid you, the spaceway has service stations that provide you with shields, weaponry, and the rare crystals that grant you extra ships.

The graphics — which combine 3-D rendered imagery with smoothly scrolling animation — and super stereo sound effects are impressive, and the game includes outstanding on-line instructions. If you have a Power Mac, you can break the intergalactic speed limit in native PowerPC mode.

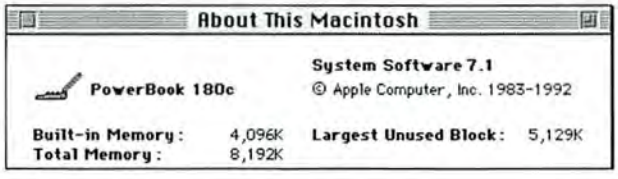


Spaceway 2000 is a sleek and solid riff on the science-fiction shoot-'em-ups with a few twists, but the fact that it falls into this overpopulated genre kept us from rating it higher. For what it is, it's extremely well done, but perhaps there's not as much gold in them thar hills as there used to be. / Jeffrey Sullivan

Spaceway 2000 ★★½ / **List Price:** $32.45. **Company:** Casady & Greene, Salinas, CA; 800-359-4920 or 408-484-9228. **Reader Service:** Circle #423.

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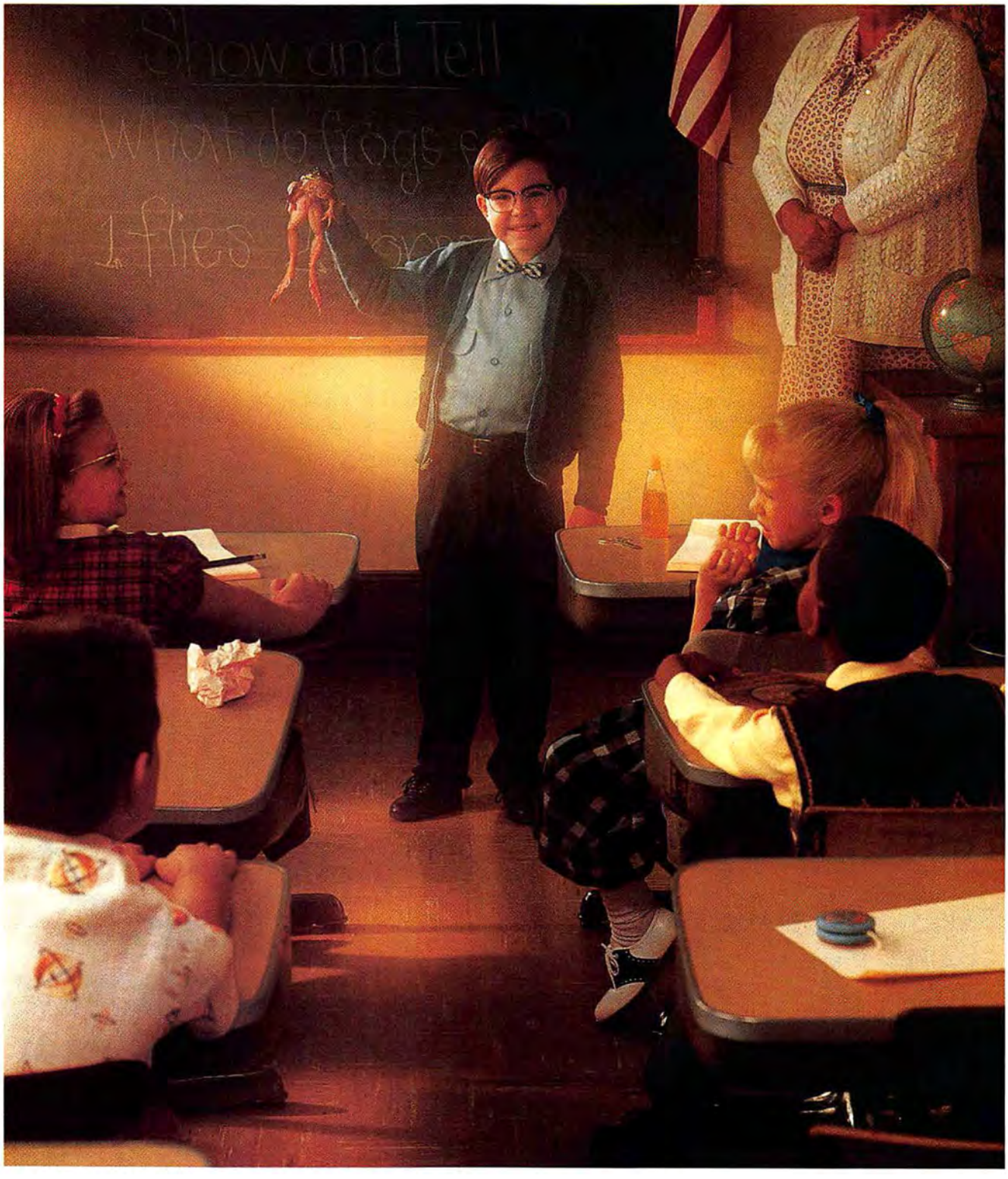
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MACWORLD MW EDITORS' CHOICE

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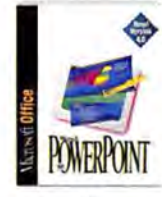
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The 50 Best CD-ROMs







Hundreds of CD-ROMs compete for attention, but only 50 make it into *MacUser*'s annual roundup of top titles. **By Carolyn Bickford**

TASTE. AS THE SAYING GOES, there's no accounting for it. You may revere Meryl Streep as the world's greatest actress, but your best friend regards her as a fingernail raking the blackboard of art. When quality can't be objectively measured by lab tests, opinion — taste — becomes the arbiter.

So it is in evaluating CD-ROM titles. You can't quantify the integrity of The Complete Maus, the beauty of Myst, or the plain ol' corny cuteness of Putt-Putt Joins the Parade, but you can sense excellence, appreciate beauty — and argue about relative quality with your friends.

That's what we did — except that the friends are *MacUser* editors with years of experience in evaluating CD-ROMs. To create our annual list of the 50 best CD-ROMs, we argued about everything from content (is it meaningful, useful, or compelling?) to interface (does it allow quick, easy navigation?). Finally, we whittled the candidates down to The List — or, this year, several lists, each spotlighting the best titles in a particular category. (In each category, the titles are listed alphabetically within groups of equal mouse ratings.)

We excluded products that use CD-ROMs purely as high-volume delivery media — collections of clip art, shareware, fonts, and photographs — as well as applications, such as Adobe Photoshop and Microsoft Office, available on CD-ROM. Several titles remain from last year's list (see "The Top 50 CD-ROMs," November '93, page 90), but this year some of their ratings have slipped a bit. Some CD-ROMs have been replaced by more-recent offerings, since improvements in the use of QuickTime, sound, hypertext, and database search technology have redefined CD-ROM excellence. As a result, many of the top discs of a year ago look a bit creaky by today's standards. CD-ROM technology has come a long way in a year, and there's lots to enjoy in this year's list. So relax and explore. By the time you've finished, it should be just about time to investigate next year's crop of discs.

PHOTOGRAPHY / GIAMPIERO BENVENUTI

Arts and Languages

Multimedia is an excellent tool for teaching about the arts or how to speak a foreign language. By showing you works of art and "pronouncing" foreign words and phrases, these discs provide a wealth of information above and beyond textbooks.

American Visions

★★★★ / *Eden Interactive; $99.99 list, $75 street.*

A magnificent set of more than 200 American paintings and sculptures from the 20th century, the American Visions CD-ROM is bolstered by revealing and informative artist profiles; commentaries by critics and artists (many of them in QuickTime); and observations

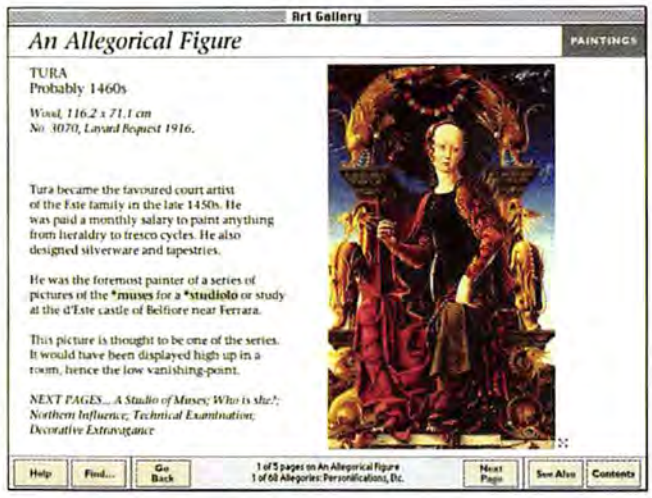


by Roy R. Neuberger, the knowledgeable art lover who collected the pieces. Works can be browsed alphabetically by artist, chronologically by year of completion, or by artistic style. This disc takes full advantage of 24-bit color — although it does not require it — so the works are presented in "true" color on suitably equipped Macintoshes.

CD Companion Series

★★★★ / *The Voyager Company; $49.95 – $59.95 list, $42 – $54 street.*

Beautiful, influential musical works — such as Stravinsky's *The Rite of Spring*, Mozart's String Quartet in C Major ("The Dissonant"), and Beethoven's Ninth Symphony — are explored and illuminated in the outstanding CD Companion Series. Along with wonderful recordings of the works, the CD-ROMs include music scholars' fascinating insights into the composers and their times, the structure and orchestration of each piece, and the significance of each work in the classical-music tradition. The black-and-white, HyperCard-based graphics are a far cry from eye-popping, but these discs are a feast for the ears — and the brain. What's more, you can play the musical selections in your audio-CD player —just skip Track 1.



Microsoft Art Gallery

★★★★ / *Microsoft Home; $79.95 list, $57 street.*

This appropriately named title contains the entire collection of the National Gallery of London: 2,000 paintings from the 14th through the 20th century. You can view works according to their artist, artistic style, historical period, or geographic area of origin or at random. You get background on the works and their creators, plus specialized "tours" of the collection, which include great animated sequences on paints and pigments and the art of restoring paintings.

Microsoft Musical Instruments

★★★★ / *Microsoft Home; $79.95 list, $56 street.*

Conch trumpets, bagpipes, harmonicas, and the hurdy-gurdy are some of the more unusual instruments you'll learn about from this disc. You can access instruments alphabetically or based on their family or their geographic region of use. You can "play" various instruments or listen to prerecorded sound samples. You're not likely to get bored — the disc covers more than 200 instruments.

Berlitz for Business Japanese

★★★½ / *Sierra On-Line; $195 list, $147 street.*

If you like the Berlitz language books, then you'll like this title. A patient *sensei* — teacher — helps you learn basic business vocabulary and phrases. You can compare your pronunciation to the correct Japanese pronunciation and ask the sensei to repeat words and phrases as often as you wish. Also included is information on Japanese culture and customs and a game in which correct answers lead you through Tokyo's labyrinthine subway system.

The Rosetta Stone

★★★½ / *Fairfield Language Technologies; $395 list, $395 street.*



The Rosetta Stone gets you involved with your foreign-language lessons immediately by presenting four photos and challenging you to pick the one that matches the word you hear pronounced and see spelled onscreen. The exercises grow in complexity — you must eventually match photos with phrases and sentences, not just words. This intuitive — if expensive — tool will quickly give you a colloquial familiarity with French, German, Spanish, or English.

Business Productivity

The best business CD-ROMs are essentially large databases of information critical to many enterprises. Their interfaces aren't particularly compelling, but if you're running a business, you'll find the data — and the ability to manipulate it to meet your needs — incredibly useful.

MarketPlace Business

★★★★ / *MarketPlace Information; $849 list, $599 street, $195 for subscription to four quarterly updates.*

MarketPlace Business contains Dun & Bradstreet-supplied profiles of more than eight million businesses nationwide. You can create mailing lists based on such specifications as types of business, geographic location, annual sales, number of employees, and ownership (public or private). However, you can generate reports on only 3,000 businesses until you pay $500 for every 5,000 additional businesses. There's no other tool like it for generating targeted mailing lists with your Mac.

Street Atlas USA

★★★★ / *DeLormé Mapping; $169 list, $98 street.*

This interactive atlas lets you zoom in from a continental overview map of the U.S. all the way to street level in any town in the country. Street Atlas USA contains labels for all streets and many landmarks. You can create custom maps easily — simply choose which streets and landmarks you want to include. Maps can be printed or pasted into other documents.



PhoneDisk Pro

★★★★ / *Digital Directory Assistance; $249 list, $166 street.*

This five-disc set contains telephone listings for 91,000,000 businesses and residences in the country — no kidding. You can search for businesses nationwide by category, so, for example, you can track down every plumber in Washington. PhoneDisc Pro is well suited for generating telemarketing call lists or address lists for direct mailing. You can also use it to find a name and address if you have only a phone number or locate neighbors of someone you can't reach directly.

AccuZip6

★★★ / *Software Publishers; $1,099 list, $550 street.*

If your business does large mailings, this powerful database program can save you money by bar-coding and presorting your mailing labels to take advantage of special postal rates. Get familiar with the postal-rate structure and requirements before you tackle this program's turgid manual, however. The current version is based on ACI US' 4D database program, but a new one based on Microsoft's FoxPro is in the works and Software Publishers promises a big speed boost. We hope the awkward setup procedure is streamlined too.

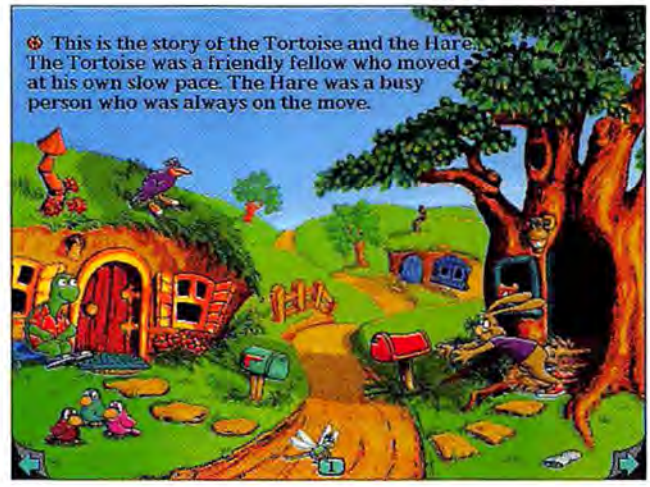
Children

We encountered a flood of children's titles this year and, as a result, we had a big batch of favorites. Some of the CD-ROMs are educational; others are mainly entertaining. To make it onto our list, each disc had to please parents as well as kids.

Living Books Series

★★★★½ / *Brøderbund Software; no list pricing, $39 street.*

This year, several delightful newcomers join old favorites such as Just Grandma and Me in this entertaining — and groundbreaking — series of interactive storybooks. Recent arrivals include The Tortoise and the Hare, an up-to-date retelling of the Aesop classic; New Kid on the Block, a hilarious introduction to poetry; and Ruff's Bone, the adventures of a lovable pooch. Like the earlier Living Books, these CD-ROMs help develop literacy skills by speaking the on-screen text, and every page is crammed with surprising sights and sounds for 3-to-8-year-olds to discover with a click of the mouse.





Where in the World is Carmen Sandiego?

★★★★½ / *Brøderbund Software; no list pricing, $58 street.*

By cleverly concealing geography lessons in a hunt for the elusive international thief Carmen Sandiego, this global-chase game has won acclaim from parents as well as the over-8 crowd. The CD-ROM version includes spoken examples of foreign phrases and indigenous music as well as a copy of *The World Almanac and Book of Facts 1994* — which comes in handy, because some of the quiz questions will stump even adult sleuths.

Cosmic Osmo and the Worlds Beyond the Mackerel

★★★★ / *Cyan; $49.95 list, $40 street.*

Osmo is a lovably shlumpy alien whose surprise-laden solar system is yours to explore and discover. You'll meet a host of funny inhabitants along the way and will discover many puzzles and diversions as well. Although this black-and-white adventure may look a bit dated when first compared with some of today's richly illustrated CD-ROM material, its humor and inventiveness will keep kids interested far longer than other, flashier offerings.

Peter and the Wolf

★★★★ / *Ebook; $34.95 list, $28 street.*

Jack Lemmon narrates the story as the classic Prokofiev music plays in the background. On-screen you see the parts acted by cartoon characters. But it's a particularly delightful section on musical instruments that makes this disc special. You can hear each instrument, see its corresponding character, and learn how the instrument works, what family of instruments it belongs to, and other basic information.

Putt-Putt Joins the Parade

★★★★ / *Humongous Entertainment; $44.95 list, $38 street.*

You wouldn't expect a little purple car named Putt-Putt to be flashy, and the hero of this charming interactive story is anything but turbocharged. Instead, he's an earnest little guy who enlists preschool-age players' help to prepare for a big parade. Youngsters love guiding him toward his goals and share in his pride when he achieves them.

Gus Goes to Cybertown

★★★½ / *Modern Media Ventures; $39.95 list, $38 street.*

Preschoolers will love guiding Gus, a singing dog, through the cartoon world of Cybertown. Surprises await Gus as he explores the clouds, park, and grocery store. As kids search through Cybertown, they learn letter identification, shape and color matching, and more.



Wacky Jack's CD Game Show

★★★½ / *StarCore; $39.95 list, $39 street.*

Four game shows (with three levels of difficulty each) help youngsters develop coordination, memory, and strategy skills. Wacky Jack is the silly cartoon contestant; the emcee's voice is that of TV veteran Don Pardo. Together they create a humorous, authentic sweepstakes atmosphere. The box recommends the CD-ROM for anyone ages 7 to 107, but we think it's more appropriate for kids 7 to 13.

Entertainment

This catchall category kept us, well, entertained. These CD-ROMs aren't necessarily educational, serious, or fact-filled. They are, however, thoughtful, compelling, or just plain fun.

Freak Show

★★★★½ / *The Voyager Company; $69.95 list, $54 street.*

The Residents, an offbeat group of rockers/performance artists, mix state-of-the-art 3-D animation with original songs and underground-comic artwork in this strangely compelling (and decidedly adult) exploration of a carnival sideshow. Performances by the sideshow inhabitants are grotesquely fascinating, but the real drama is behind the scenes, where clues to each performer's dramatic, often tragic, life await discovery.





Gadget

★★★★½ / *Synergy; $79.99 list, $79 street.*

An apocalyptic newscast on your hotel-room radio, a swapped suitcase, and a series of mysterious messages set you on a strange journey through Gadget's eerily beautiful technoworld. Although not strictly a game (there's no way to lose), Gadget requires you to collect and use fanciful high-tech devices and conveyances on your way to unlocking the story's secret. Apart from the plot, extraordinary 3-D rendering and graphic design make this world a pleasure to explore.

A Hard Day's Night

★★★★ / *The Voyager Company; $39.95 list, $29 street.*

This disc contains the complete Beatles movie plus the original script (with markups), production notes, essays on the film, and other goodies sure to please the Beatlemaniac in all of us. The film is funny, the songs are great (and sound respectable on the Mac), and it's interesting to follow the script to see whether the lads stuck to their lines.

Xplora 1

★★★★ / *Interplay Productions; $49.95 list, $49 street.*

Peter Gabriel presents a rich experience for the MTV generation with this disc, the most successful of several offerings from aging-rockers-gone-interactive. Just about everything you see in this musical exploration is linked to some activity aimed at uncovering Gabriel's creative processes. Fans will appreciate interviews with the artist and his band mates, but even those unfamiliar with his music can enjoy remixing a record in the studio or sharing Gabriel's passion for world music by "playing" exotic instruments.

Baseball's Greatest Hits

★★★½ / *The Voyager Company; $59.95 list, $57 street.*

Our only entry for sports fans, Baseball's Greatest Hits is filled with memorable moments from this all-American sport. You can watch Hank Aaron break Babe Ruth's home-run record, hear Lou Gehrig's famous farewell, and tackle the world's toughest baseball trivia game. This fan pleaser includes a wealth of QuickTime movies, play-by-play recordings, photographs, interviews, and period writings.

Comic Book Confidential

★★★½ / *The Voyager Company; $49.95 list, $33 street.*

The heart of this disc is a 90-minute documentary spotlighting creators of superhero and underground comic books. You can watch the movie start to finish, but it's more instructive to single out interviews featuring luminaries such as R. Crumb, Lynda Barry, and the late Jack Kirby; see and hear them discuss their work; and then peruse one of the disc's samples of their art. Note: Some of these comics are definitely *not* for children.



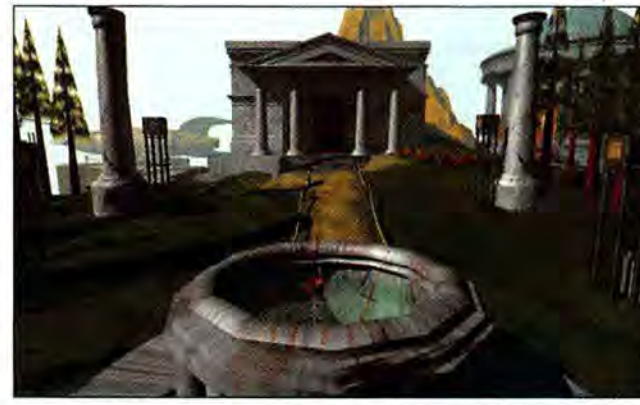
Fun and Games

Everyone loves a good game — and games on CD-ROM tend to be quite good. With all that disc space available, game developers are free to create intricate, realistically drawn worlds, high-quality sound tracks, and moving, talking characters of every description — which is exactly what many of our favorite titles contain.

Myst

★★★★½ / *Brøderbund Software; $59.95 list, $52 street.*

The delicious mystery of Myst begins as you fall into the pages of a book and land in a strange, uninhabited island world. As you explore the world and solve a series of challenging puzzles, you'll discover additional worlds (beautifully rendered in 3-D) and uncover clues to the fate of their missing inhabitants. A sophisticated musical



soundtrack, haunting sound effects, and clever QuickTime movies enhance dozens of hours of game play. *MacUser*'s editors can hardly wait for the sequel.

Cosmology of Kyoto

★★★★ / *Yano Electric Co.; $98 list, $98 street.*

This beautiful, eerily rendered adventure game doubles as a fascinating crash course in the religions and superstitions of medieval Japan — when Shinto and Buddhism first vied for people's belief. Explore the ancient city of Kyoto in quest of knowledge, wealth, and good karma — but watch out for ghosts. An on-line text on Japanese mythology offers hints and sheds light on the supernatural events you witness.

Jump Raven

★★★★ / *Paramount Interactive; $69.95 list, $48 street.*

Keep your finger on the trigger and your tongue in your cheek for this fast-paced action-arcade game that spoofs its own genre. Rapid-fire shoot-outs on the streets of a bleak future city are interspersed with shopping sprees at the Weapons Mart, and you'll enjoy banter from whichever of the eight attitude-laden copilots you pick to ride shotgun. As a bonus, you can also select the musical style of the game's soundtrack.

Wrath of the Gods



★★★★ / *Luminaria; $69.95 list, $46 street.*

This quest through ancient Greece offers a winning combination of humor, mythology, and hours' worth of tricky puzzles. QuickTime movies are used to great effect, as actors playing the likes of Hercules, Medusa, and a Cyclops pose challenges based on classical myths. Success earns you points; missteps land you in Hades. A wisecracking oracle is always available to help.

Indiana Jones and the Fate of Atlantis

★★★½ / *LucasArts Games; $69.95 list, $42 street.*

This engaging arcade-style action game is different from similar offerings, thanks to its variable plot lines. Early on, you're confronted by an all-brawn, no-brains guard. How you deal with him determines how the rest of your game will go. For instance, outwit him, and your game is one of wits; fight him, and your game is battle-heavy. This fast-paced game lives up to the whip-cracking *Indiana Jones* movie series that inspired it.

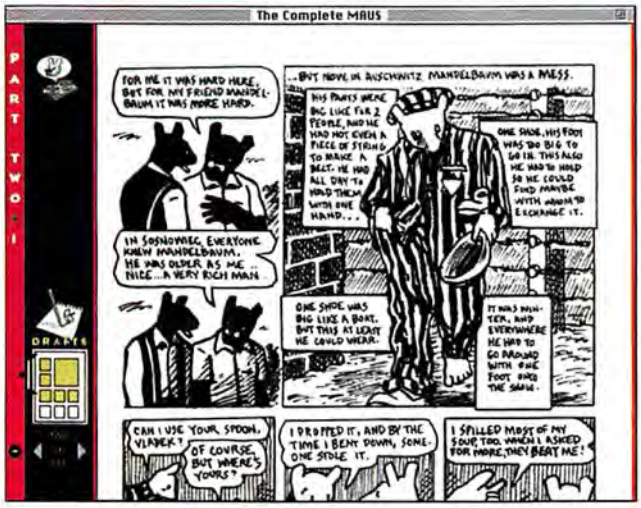
Iron Helix

★★★½ / *Spectrum HoloByte; $99 list, $61 street.*

This extremely cinematic sci-fi adventure remains a favorite, despite its sluggishness, because it turns shoot-'em-up adventure games on their ear. For once, you don't have a weapon. In this game, you pilot a helpless maintenance droid that must outrace a killer defender robot and reprogram a runaway starship before it destroys a living world.

History

For history buffs, there's nothing better than facts and figures, old photographs, detailed maps, and informed commentary. All the titles we chose in this category excel at bringing some long-ago era to life on our desktops.



The Complete Maus

★★★★½ / *The Voyager Company; $59.95 list, $49 street.*

Art Spiegelman's *Maus: A Survivor's Tale*, a comic-book retelling of Spiegelman's father's oral history of surviving the Holocaust, won a well-deserved Pulitzer Prize. This CD-ROM includes the complete two-volume comic-book set as well as Spiegelman's observations about the design of the book, maps, and other supplemental material. The extras enrich an already extraordinary document.

Seven Days in August

★★★★½ / *Time-Warner Interactive Group; $59.99 list, $47 street.*

The construction of the Berlin Wall and the chill of the Cold War are brought to life in this documentary disc. Historic TV news clips and current-day interviews with residents of East and West Berlin are interwoven with clips from Berlin, Wisconsin. The result is a thoughtful juxtaposition of the events in Germany with daily life in 1961 America. Profiles of world leaders and a roundtable discussion by political pundits supply analysis and context for the dramatic events.

Twelve Roads to Gettysburg

★★★★½ / *Ebook; $29.95 list, $29.95 street.*



Created by a graphic designer who's also a Civil War buff, this CD-ROM makes excellent use of animation, maps, and photos to bring the Civil War's most pivotal battle to life. The disc provides fascinating moment-by-moment re-creations of the three-day Battle of Gettysburg and also illuminates the political issues and military personalities that shaped the five-year war.

Exploring Ancient Cities

★★★½ / *Sumeria; $59.95 list, $42 street.*

Authoritative text from *Scientific American* magazine and newly produced video, photographs, interactive maps, music, and narration shed light on four ancient civilizations in this information-rich disc. Virtual tours of archaeological sites reveal the architecture and

culture of Crete's Minoan civilization, the permanent Bedouin city of Petra in Jordan, the pre-Colombian metropolis of Teotihuacan in Mexico, and the Roman city of Pompeii.

The First Emperor of China

★★★½ / *The Voyager Company; $79.95 list, $56 street.*

This disc explores the remarkable life of China's first emperor, Qin Shi Huang Di, and the imprint he left on history by building the Great Wall of China. You can view sketches from the Qin dynasty, and you can travel along the Great Wall of China. Also revealed are the equally remarkable trappings of his death: Artifacts placed in his tomb included more than 6,000 pottery men and horses.

Who Built America?

★★★½ / *The Voyager Company; $99.95 list, $61 street.*

This marvelous volume chronicles U.S. history from the centennial celebration of 1876 up to the First World War. The volume focuses on the growing influence of industry, organized labor, minorities, women, and immigrants during this tumultuous time. The disc supplies rich historical detail and brings alive the era's popular culture with editorial cartoons, excerpts of hit songs, and loads of photographs.

The Natural World

The titles in this category span the universe, from the planets and stars to the depths of the ocean. Drawings, photos, and QuickTime movies let you see bits of nature you might not otherwise experience.

Ocean Life: Hawaiian Islands

★★★★ / *Sumeria; $49.95 list, $35 street.*

This CD-ROM combines a series of gorgeous QuickTime video clips of nearly 100 brilliantly colored Hawaiian fish with an encyclopedic compilation of facts about their habitat and behavior. The visual treat of observing the sea creatures is reason enough to check this title out; the fact that you'll undoubtedly learn something is a bonus.



Prehistoria

★★★★ / *Grolier Electronic Publishing; $69.95 list, $50 street.*

The Flintstones and *Jurassic Park* have proved that dinosaurs are far from extinct at the box office, and they're flourishing in a raft of titles on CD-ROM as well. This one, with striking illustrations and lots of kid-pleasing dino-lore, traces links between prehistoric creatures and their more familiar modern descendants.

The Rainforest

★★★★ / *REMedia; $59.95 list, street price not yet available.*



If you've ever wondered about the greenhouse effect but fell asleep in high-school biology while photosynthesis was being explained, this visually stunning CD-ROM is for you. Packed with photos, text, and QuickTime movies, this disc teaches you about the diverse ecosystem of the rain forests and the indigenous cultures that inhabit them. Even non-tree-huggers will be moved by the facts and figures as well as the compelling images of the world's dwindling rain forests.

Redshift

★★★★ / *Maris Multimedia; $99 list, $58 street.*

Stunning 3-D renderings of the solar system, based on photographs taken by NASA and the former Soviet space agency, are the basis of this cosmic travelogue. Packaged tours let you watch celestial events from your home town, exotic Earth locations, the far side of our moon, or even from one of Jupiter's moons. Ambitious users can plumb the daunting interface to chart their own journeys through space — and save them as QuickTime movies.

From Alice to Ocean

★★★½ / *Claris Clear Choice; $69 list, $49 street.*

This beautiful documentary of a woman's odyssey across the Australian outback shipped with many of Apple's CD-ROM drives and has been enjoyed as a superb interactive coffee-table disc. The gorgeous scenery, captured in photos and QuickTime movies, still looks great, and the text on the outback's ecology remains fascinating. Best of all, the CD-ROM now comes packaged with the equally beautiful coffee-table book it's based on.

The San Diego Zoo Presents . . . The Animals!

★★★½ / *The Software Toolworks; $59.95 list, $41 street.*

This multimedia tour of the San Diego Zoo explores the lives and habitats of more than 200 animals. You'll find 1,300 photos, an hour of video clips, and a wealth of animal sounds. You can view animals by family (such as all types of cats) or view only baby animals. The text includes interesting animal tales but not much in the way of hard-core scientific information.

Reference Works

If you're running out of room on your bookshelf, you'll appreciate the compact, fact-filled CD-ROMs we've included in this category. In many cases, these titles can replace, not just supplement, their paper counterparts. And the easy searching is a definite bonus.

Microsoft Bookshelf

★★★★★ / *Microsoft Home; $99 list, $66 street.*

At last, a reference CD-ROM that has it all. Combined in one easy-to use volume are The American Heritage Dictionary of the English Language, The Original Roget's Thesaurus of English Words and Phrases, The Columbia Dictionary of Quotations, The Concise Columbia Encyclopedia, the Hammond Intermediate World Atlas, The People's Chronology (a historical time line), and The World Almanac and Book of Facts 1994. Search for topics in all seven books at once or in any subset.

Compton's Interactive Encyclopedia

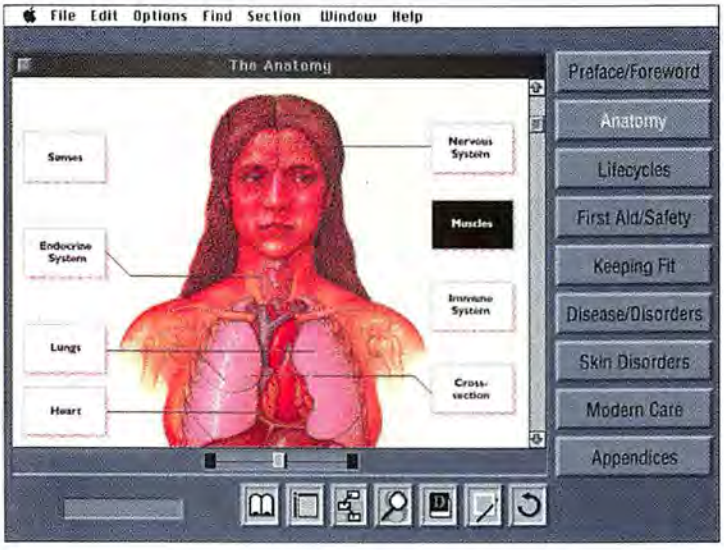
★★★★ / *Compton's NewMedia; $149.95 list, $100 street.*

One of the best implementations of hypertext we've seen: Double-click on any word and get its definition; Option-click and get its encyclopedia entry. Click on related icons to open pictures, movies, sound files, and maps. You can also easily move between entries and a time line. The entries are fairly comprehensive, but they don't totally replace the pleasure of browsing through a multivolume, printed encyclopedia.

Mayo Clinic – Family Health Book

★★★★ / *IVI Publishing; $69.95 list, $57 street.*

Straightforward, detailed entries on human anatomy and physiology, common illnesses and injuries, first aid, and preventive health care are richly illustrated with photos, drawings, and animation. You can search for words or phrases, look up entries in an index, and click on highlighted words to bring up related entries. This excellent resource helps demystify medical terms and procedures and can even help the whole family stay healthy.



Microsoft Cinemania '94

★★★★ / *Microsoft Home; $79.95 list, $56 street.*

Film junkies, rejoice: This cinematic treasure trove summarizes hundreds of movies and includes many stills and audio and video clips. Capsule reviews for each movie are supplied by Leonard Maltin, and many of the films are also reviewed by Roger Ebert and/or Pauline Kael. You can search for films by any combination of title, performer, director, or awards received; look up bios of stars and directors; or find definitions of movie lingo.



The New Grolier Multimedia Encyclopedia

★★★★ / *Grolier Electronic Publishing; $149.95 list, $100 street.*

Loaded with photos, QuickTime clips, and graphics, this encyclopedia is an interactive visual feast. A "knowledge tree" that branches from broad subject areas to more tightly focused topics helps you brainstorm ideas for research or reports. The text isn't as easily navigable as in Compton's Interactive Encyclopedia, but you get more images.

Time Almanac 1993

★★★★ / *Compact Publishing; $99.95 list, $73 street.*



This recent-history reference contains the complete text of *Time* magazines published from 1989 to 1993 as well as a multitude of images and QuickTime movies. You can search for topics and narrow your searches by using AND operators. You also get profiles of 20th-century world leaders such as Churchill and Stalin, including video clips of interviews. For a quick overview of the '70s, '80s, and '90s, you can display highlights of each decade's events.

How Computers Work

★★★½ / *Time-Warner Interactive Group; $79.99 list, $52 street.*

This disc provides an excellent overview of technology. Articles are clearly written and include definitions of most common computer



terms as well as labeled images of many of the technologies and components. The disc also contains extensive information on the history of computing — starting with the original "digital" system: counting on fingers.

Mayo Clinic – The Total Heart

★★★½ / *IVI Publishing; $59.95 list, $34 street.*

Clear, authoritative text and excellent medical illustrations and animation discuss human heart function, anatomy, and health in terrific detail. The CD-ROM addresses medical procedures for testing and correcting cardiac problems and offers advice for keeping your heart healthy.

MovieSelect

★★★½ / *Paramount Interactive; $59.95 list, $38 street.*

With this fun program that recommends movies for you, based on your favorites, you'll never have to wander aimlessly through video-rental stores again. Answer a few questions about movies you've enjoyed in the past as well as the kind of flick you're in the mood for right now, and MovieSelect will crank out a list of suggested titles for you.

MacUser associate editor Carolyn Bickford examined more than 200 CD-ROMs while compiling this article and endured a dozen opinionated *MacUser* editors.

Directory / vendors of the 50 best CD-ROMs

Brøderbund Software
Novato, CA
800-521-6263
415-382-4400
415-382-4419 (fax)

Claris Clear Choice
Santa Clara, CA
800-325-2747
408-987-7000
408-987-3932 (fax)

Compact Publishing
Washington, DC
800-964-1518
202-244-4770
202-298-8487 (fax)

Compton's NewMedia
Carlsbad, CA
800-862-2206
619-929-2500
619-438-2330 (fax)

Cyan
Spokane, WA
800-718-8887
509-468-0807
509-467-2209 (fax)

DeLormé Mapping
Freeport, ME
800-452-5931
207-865-1234
207-865-9291 (fax)

Digital Directory Assistance
Bethesda, MD
800-541-3269
617-639-2900
617-639-2980 (fax)

Ebook
Union City, CA
510-429-1394
510-713-8904

Eden Interactive
San Francisco, CA
800-743-3360
415-241-1450
415-241-1459 (fax)

Fairfield Language Technologies
Harrisonburg, VA
800-788-0822
703-432-6166
703-432-0953 (fax)

Grolier Electronic Publishing
Danbury, CT
800-285-4534
203-797-3530
203-797-3130 (fax)

Humongous Entertainment
Woodinville, WA
206-485-1212
206-486-9494 (fax)

Interplay Productions
Irvine, CA
800-969-4263
714-553-6678
714-252-2820 (fax)

IVI Publishing
Eagan, MN
800-754-1484

LucasArts Games
San Rafael, CA
800-782-7927 (U.S.)
800-828-7927 (Canada)
415-721-3394
415-456-4381 (fax)

Luminaria
San Francisco, CA
415-821-0536
415-821-0167 (fax)

Maris Multimedia
Oakland, CA
800-336-0185
510-652-7430

MarketPlace Information
Waltham, MA
617-894-4100
617-894-1656 (fax)

Microsoft Home
Microsoft
Redmond, WA
800-426-9400
206-882-8080
206-635-6100 (fax)

Modern Media Ventures
San Francisco, CA
800-530-5080
415-546-1515
415-546-1590 (fax)

Paramount Interactive
Palo Alto, CA
800-428-5331
415-813-8040
415-813-8055 (fax)

REMedia
Poway, CA
800-843-9497
619-486-5030
619-486-0679 (fax)

Sierra On-Line
Bellevue, WA 98007
800-743-7725
206-562-6050
206-562-3031 (fax)

Software Publishers
Huntington Beach, CA
800-233-0555
714-492-5333
714-492-2544 (fax)

The Software Toolworks
Novato, CA
800-234-3088
415-883-3000
415-883-3067 (fax)

Spectrum HoloByte
Alameda, CA
800-695-4263
510-522-3584
510-522-3587 (fax)

StarCore
Apple Computer
Cupertino, CA
800-708-7827
408-974-3886

Sumeria
San Francisco, CA
800-478-6374
415-904-0800
415-904-0888 (fax)

Synergy
Tokyo, Japan
81-3-5272-9610 (fax)

Time-Warner Interactive Group
Burbank, CA
800-482-3766
818-955-9999
818-955-6499 (fax)

The Voyager Company
New York, NY
800-446-2001
212-431-5199
212-431-5799 (fax)

Yano Electric Co.
c/o Azuma Lander
San Francisco, CA
415-928-7914
415-362-6879 (fax)

Mastering Multimedia

Which is your best choice for breaking into multimedia: the longtime champ, Macromedia Director, or the upstart challenger, Apple Media Kit?

By Patrick Milligan and Chris Okon

MULTIMEDIA INSPIRES visions of dollar signs. If you want to be part of the action as a developer or publisher of multimedia products or if you're a seasoned desktop-publishing veteran in search of some new skills and opportunities, take note — the multimedia *authoring* (development) tool you buy can make the difference between success and failure. Before you venture into the wild and woolly frontier of multimedia development, read on: Two multimedia pioneers are battling for territory, and you need to choose the one most likely to lead you through the wilderness.

Almost since the dawn of multimedia on the Macintosh, your choices in multimedia authoring tools were limited to learning Macromedia's venerable Director; using HyperCard, SuperCard, or Authorware; or mastering nuts-and-bolts programming in languages such as C or C++. Last year, however, Apple came out with its own authoring tool, Apple Media Kit, which consists of Apple Media Tool (an authoring application) and Apple Media Tool Programming

PHOTOGRAPHY / LEON


CIRCULATION GROWTH
Average Circulation
Rate Base
170K
213K
12/87
6/88
12/88

Environment. Apple Media Kit is aimed at would-be multimedia developers who just can't make sense of — or can't be bothered with — Director's complex interface and scripting language, Lingo.

Just as Aldus PageMaker and QuarkXPress are battling head-to-head in the page-layout field, so too are Director — now up to version 4.0 — and Apple Media Kit vying for control of the multimedia market. But be forewarned: These tools aren't for the faint of heart — multimedia authoring doesn't mean simply sticking a few sounds or QuickTime movies into a business presentation. We're talking about serious multimedia product creation: CD-ROM titles, games, corporate training materials, sophisticated interactive kiosks, and so on. If these are the sorts of things you want to create, pay close attention. Picking the wrong authoring tool can bring an early end to an excellent idea — or a promising career.

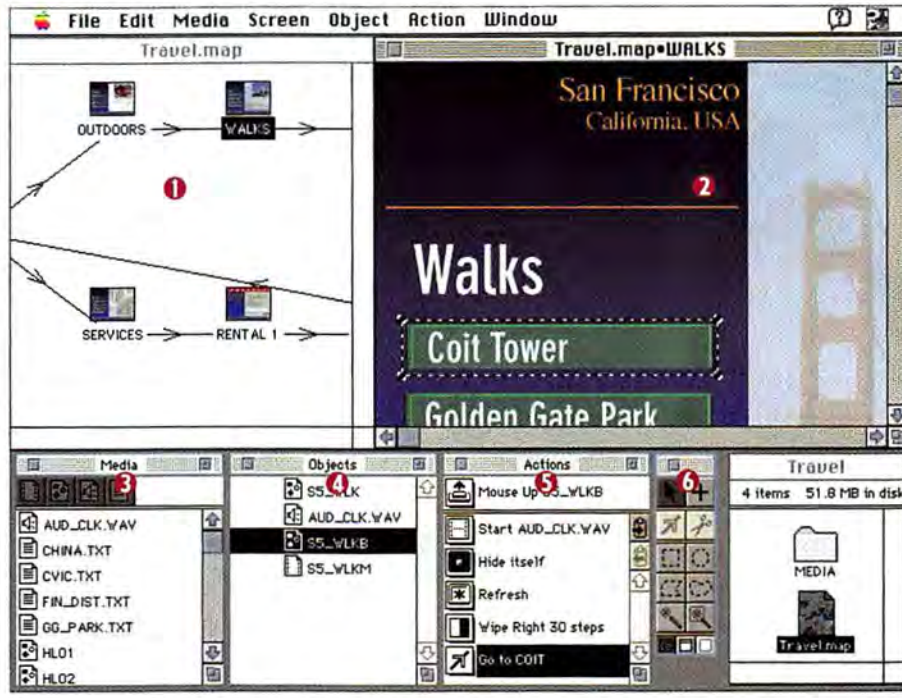


figure 1 / **Apple Media Kit** was deliberately designed to have an interface that would be simpler than Director's. This example shows most of Apple Media Kit's user-interface elements: the map ❶; one of the screens ❷; the Media, Objects, and Actions miniwindows ❸, ❹, and ❺, respectively; and the AMT tool palette ❻.

A Little Help from Your Friends

The entry fee for becoming a multimedia developer or integrator can be daunting — the cost of the authoring tools themselves can be steep and the time required to learn them long. But before you even pick up the phone to check the prices of authoring tools or training courses, take a close look at the skills of the people you'll be working with along the way. The composition of your crew will affect your choice of authoring tool.

When creating multimedia projects, you'll rarely work alone — unless you're a multitalented Leonardo. You'll need to tap a variety of skills, ranging from designing to programming. Chances are good that you won't find all the skills in any one person. If you already have a staff and a production process intact or in mind, you'll want to get the tool that best matches that setup. If you're starting from scratch, however, the tool you choose will have a great impact on the type of people you need and the production process you will use.

Professional multimedia developers regard several criteria as important for tool selection: cost, effect on the production process, extensibility, ease of use, media management, service and support, performance, and cross-platform compatibility. Here's what we discovered about how Director and Apple Media Kit stack up in terms of these critical considerations.

Buying and Licensing

ADVANTAGE: A DRAW Director 4.0 and Apple Media Kit 1.1 differ in many ways, not the least of which is cost and availability. Apple Media Kit, including Apple Media Tool (which can be a great prototyping tool on its own) and Apple Media Tool Programming Environment, costs $1,495. Apple Media Tool (AMT) is available separately for $795; AMT Programming Environment by itself costs $995. Special pricing for nonprofit organizations and higher-education institutions is available. Apple Media Kit and its separate components are currently available only through the Apple Professional Developers Association (APDA); AMT was scheduled

The Bottom Line

MacUser ZD LABS COMPETITION BREEDS EXCELLENCE. Finally, multimedia developers have a choice in authoring tools — and each is worthy of our recommendation. But before you decide on one, make sure you have a good idea of the kind of artistic and programming resources available to you and the production model you plan to use. Matching the authoring tool to these variables is critical.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	EASE OF USE	FEATURES
$$$$ **Apple Media Kit 1.1**	●	⊖	⊕	⊕

MacUser RECOMMENDS

A novice can create fairly sophisticated interactive pieces with Apple Media Kit, and a programmer is treated to a programming language and an interface superior to Director's. You'll most likely have to split complex creative tasks between artists and programmers, however.

$$$$ **Director 4.0**	●	⊕	●	⊕

MacUser RECOMMENDS

Be prepared to climb a steep learning curve, because building interactivity into Director 4.0 projects requires Lingo programming. On the plus side, Director offers excellent integration of project-building tasks and media handling.

Listing is alphabetical within groups of equal mouse ratings.

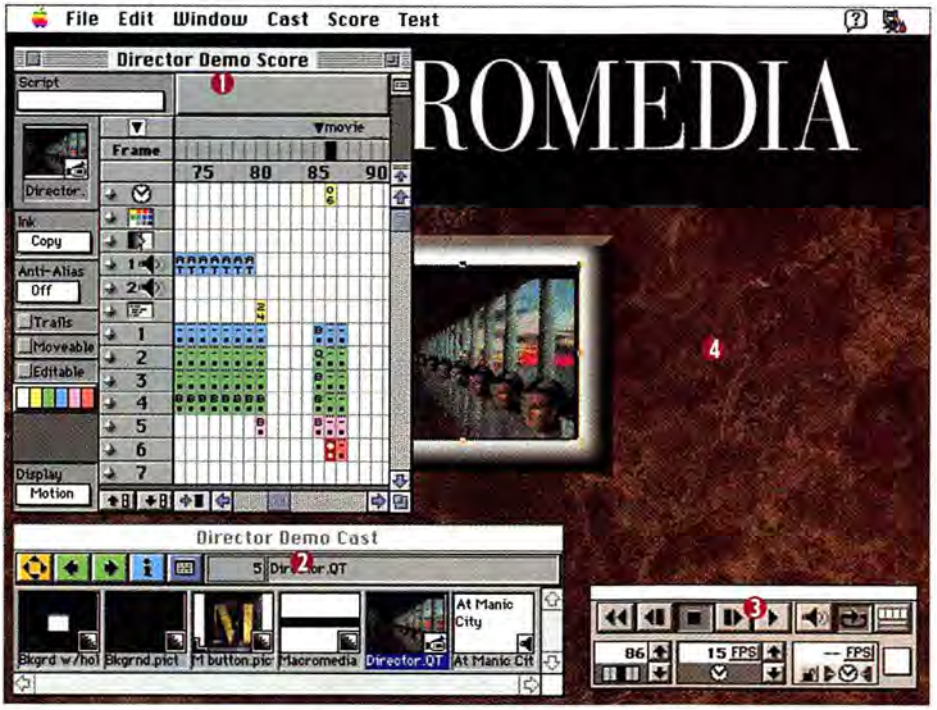


figure 2 / **Director 4.0's interface** is daunting but powerful. The four major elements of the Director 4.0 interface are the Score window ❶; the Cast window ❷; the Control Panel window ❸; and the Director Stage ❹, which is positioned at frame 86 of the score.

to be released into mainstream distribution channels by late summer.

Enterprise and commercial publishers must pay a licensing fee of $500 for each title created with Apple Media Kit or its separate components, regardless of platform or distribution quantity. The license allows developers to distribute Apple Media Kit run-time applications as well as QuickTime and QuickTime for Windows files. The licensing fee is customarily waived for educational institutions and nonprofit organizations.

Buying Director is less complicated. For $1,195 list (less with special deals and bundling), you get a complete authoring environment for the Mac and Windows-based machines without a licensing fee. If you wish to develop cross-platform projects, however, you need to purchase Director for Windows (also $1,195) in addition to the Mac version. However, for those who want to buy both the Mac and the Windows versions of Director at the same time, Macromedia offers a bundle of the two for a list price of $1,995.

Process Management

ADVANTAGE: A DRAW Director and Apple Media Kit are each made up of two elements: the authoring application itself and a programming environment that allows developers to extend the power and flexibility of the authoring application. In the case of Director, these two elements are integrated fairly closely. You can add functions to Director by using Lingo, Director's scripting language, and Lingo can be extended through separately programmed routines called XObjects, which are accessible from within Director.

Because Director is such a Swiss-army-knife product — incorporating animation, paint, media integration, and scripting capabilities in one application — it lends itself to a production process in which the people creating the individual media elements (text, sound, video, and animation) may be the same people who incorporate those media elements into a multimedia project and create the scripts — or at least work closely with those who do. So if you have staff members who are good designers and understand the intricacies of media integration and scripting, Director may be a better fit than Apple Media Kit.

For instance, it's easy to test small sections of a program created with Director, even if the program includes complex Lingo scripts. And if the section doesn't work, it's easy to check for errors (Director can automatically check your Lingo code) and correct them as you go. This means that even if you do have different people handling media integration and scripting, moving between the two tasks is fluid and bidirectional.

Apple Media Kit has no facility for creating media elements — Apple presupposes a more DTP-like production cycle, in which creators of the media elements hand off their work to integrators and programmers.

In the Apple Media Kit scenario, someone creates media elements and hands them off to an AMT operator, who integrates the elements into the project and adds basic interactivity. That operator then hands over the project to a programmer, who uses AMT Programming Environment to add whatever extra programming is required (such as adding hooks to databases or folding in complex interactivity that AMT can't provide). In order to test the functionality of that programming, you must either compile the entire project or create a copy that duplicates only the part of the project you wish to test. Either way, if there's a problem in the interaction between the added code and what was handed over from the AMT operator, the whole thing must go back to the AMT operator and then to the programmer for modification — this lack of flexibility can make small changes very time-consuming.

The problem with the Director model is that it forces artists and designers to either work closely with — or *be* — Lingo programmers, which is not always practical. Apple Media Kit assumes that artists, designers, and programmers should be left alone to do what they do best.

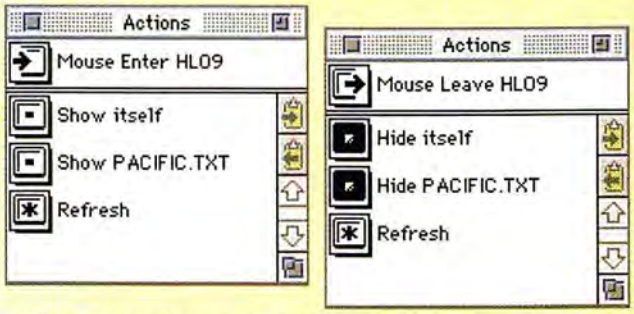
The ease with which an artist or designer can integrate all the media elements and add interactivity is also an important difference between Director and Apple Media Kit. Director puts everything under one roof, but that doesn't mean it's likely that any one person will be good at using all of its features. A skilled artist or designer may be able to create attractive media elements within Director and even incorporate them into a Director score, or

Where's the Mouse? / how Apple Media Kit and Director handle a simple programming task

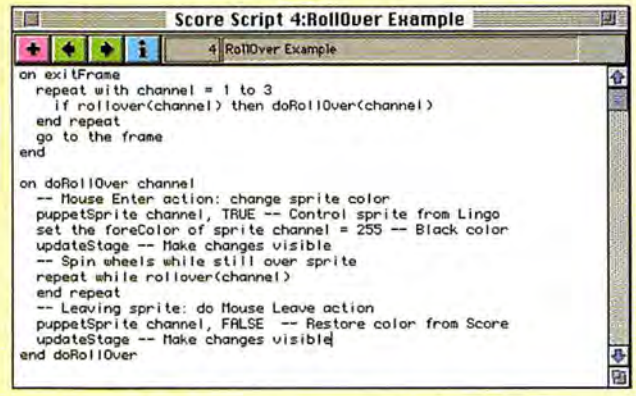
PROVIDING FEEDBACK or taking actions based on the cursor entering a screen region or hot spot is a powerful and common interface technique for multimedia projects. Apple Media Kit and Macromedia Director go about implementing this technique in very different ways.

Apple Media Kit's approach is *event-based,* which means that Mouse Enter is an event that can cause one or more commands, effects, or links to happen. Similarly, a Mouse Leave event can trigger a different set of actions.

Macromedia Director, on the other hand, takes advantage of a repeated-polling mechanism: The RollOver function queries whether the cursor is within the specified *sprite,* a representation of a cast member or any media element that is manipulable within Macromedia Director. The RollOver function is looped to repeatedly poll the sprite. To achieve the same result as with Apple Media Kit, the RollOver must be done first to detect the Mouse Enter condition and again to determine the Mouse Leave condition.



Actions miniwindows in Apple Media Tool show Mouse Enter and Mouse Leave events. As you can see in the first window, when the cursor enters the region of media element HL09, HL09 becomes visible, and media element PACIFIC.TXT becomes visible. In the second window, when the cursor leaves HL09, HL09 becomes invisible, as does PACIFIC.TXT.



A Director Script window shows the Lingo code fragment necessary for ascertaining whether the cursor has entered a specified region.

timeline, but even the most trivial of interactivity (such as "go to frame 'intro'") requires some knowledge of Lingo. It's true that you can accomplish most interactivity by using fewer than ten basic Lingo commands, but anything more complex requires more Lingo expertise than most designers will ever want to possess. The result is that you need a skilled Lingo programmer to complete projects of any complexity, even though the Lingo script is created within the same application.

Extensibility

ADVANTAGE: DIRECTOR Extensibility is the ability to move beyond the built-in limits of an authoring application — the way plug-ins extend Photoshop, for instance. This includes accessing databases, using XCMDs (external commands), working with other tools, controlling external devices, and adopting other formats.

Director is extensible through Lingo, and Lingo is extensible through XObjects. Director's XObject interface lets you access the Mac's Toolbox by using C or Pascal programming. There is even an XObject that comes with Director called XCMDGlue, which allows access to many XCMDs that were originally for HyperCard. As for Apple Media Kit, you can do a lot with AMT before you must reach for the power of AMT Programming Environment. Although Programming Environment is more challenging for most people than Lingo, it's a classic programming language with a clean interface to C and it easily extends to system calls — in fact, AMT itself was written with Programming Environment. Experienced programmers should have little difficulty learning the grammar of Programming Environment.

Lingo has been around longer and has a larger vocabulary than Programming Environment. Lingo language elements consist of hundreds of commands, properties, functions, keywords, methods, handlers, and operators. But Lingo is not as strongly object-oriented as Programming Environment, whose grammar has a higher level of abstraction that allows you to combine a seemingly small set of objects and actions in a variety of ways to create a myriad of commands. Also, with Programming Environment, you can easily create an object and assign it properties by using the program's handy, built-in templates; with Director, you must have intimate knowledge of a large number of Director functions in order to invent code for new tasks.

Ease of Use

ADVANTAGE: APPLE MEDIA TOOL Macromedia has made a few interface modifications to Director 4.0 to improve Director's ease of use. Most of the improvements to Director seem to benefit real power users and do little to encourage new ones. For instance, you can now color-code *cast members* (individual media elements) within the Score window to help keep track of the elements in a large, complex project. Unfortunately, it's impossible to apply global changes to elements based on their color code. Director 3.1's Overview feature, which simplified the interface for beginners even though it was poorly implemented, was dropped altogether in version 4.0.

The AMT portion of Apple Media Kit is remarkably easy to use. You can create a complete project — as well as compile cross-platform run-time applications — within AMT without having to rely

on Programming Environment. And AMT's simple drag-and-drop metaphor makes designing and laying out screens and adding interactivity a breeze.

Compared to Director 4.0's consistently steep learning curve, AMT's curve is quite gradual — although that for Programming Environment is almost vertical for all but experienced object-oriented programmers.

Media Management

ADVANTAGE: A DRAW To remain one step ahead of chaos, you need to keep track of all elements of a production as well as orchestrate the integration process. *Media management* describes the basic ability of authoring tools to collect and organize different types of media.

In Director, all the media elements are organized as a *cast*. A cast for a single movie in version 4.0 can contain as many as 32,000 members, an enormous increase from the limit of 512 in version 3.1. The Cast window shows small icons (in one of three sizes) representing the type of data in the cast member. You can sort casts by name, type, size, and other criteria.

AMT, on the other hand, has a simple media miniwindow that displays the names of the media files available in a project. Four media-selector buttons let you list QuickTime, Picture, Sound, and Text files (or some combination of the four).

So, although there are significant improvements to the Cast window in Director, there are obvious weaknesses in the interface, such as the Score window, which looks a lot like a spreadsheet. AMT's approach is clean and efficient and is well matched to the overall slide-based interface, but in a complex project, navigating through all the media elements can be a real burden.

Service and Support

ADVANTAGE: DIRECTOR Documentation and technical support contribute to overall ease of use. Both Apple Media Kit and Macromedia Director include all-new documentation with step-by-step tutorials, on-line help, sample media, and project examples. Director includes a complete Lingo dictionary as well. Documentation for AMT Programming Environment is hefty, extensive, and aimed at experienced programmers.

For support, Apple Media Kit developers and consumers alike must wade through a common pool before finding the right course. Apple's telephone-based technical support begins with a labyrinthine journey through an all-purpose voice-messaging system. We were referred to several departments and were even advised to contact local user groups before we entered a queue with a 40-minute wait. (Apple plans to launch a fee-based support plan later this year.)

We experienced much better luck with an AppleLink message to Media KitDTS, which found its way directly to a person who understood Apple Media Kit. We asked if Apple Media Kit worked with custom palettes; the direct answer was No, although we did receive several leads to developers who have experimented with palette modification.

Longtime Director users have no doubt noticed an improvement in support from Macromedia over the years. Convoluted call referrals and interminable wait times have been reduced to a simple phone-pad selection and a few minutes' wait. The support representative we reached displayed knowledge and courtesy that could come only from conscientious training. Macromedia also offers on-line support forums as well as a special program for Director developers.

Performance

ADVANTAGE: DIRECTOR For multimedia authoring tools, performance is a measure of how quickly and efficiently a developer can accomplish an action. It also describes to what extent multimedia

Report Card / what's good, what's bad

Apple Media Kit 1.1

What's Good:

1. Simple but powerful drag-and-drop interactivity.
2. Cross-platform media-conversion tools.
3. Interface facilitates rapid prototyping and storyboarding.
4. Automatic playback optimization.
5. Professional, object-oriented programming tools.

What's Bad:

1. Lacks palette support — including support for multiple custom palettes, palette cycling, fades, and animations.
2. Memory management is controllable only through AMT Programming Environment.
3. Background sound plays only within screens, not across screens.
4. Technical support is difficult to obtain.
5. Licensing fee is required for commercial projects.

Macromedia Director 4.0

What's Good:

1. True cross-platform authoring (either Mac or Windows).
2. Easy to extend via XObjects and XCMDs.
3. Integrated animation tools.
4. Good QuickTime controls (version 4.0 still lacks full support for QuickTime 2.0, however).
5. Complete support for color palettes, including animation and cycling.

What's Bad:

1. Requires too much scripting, even for constructing basic prototypes and storyboards.
2. Lacks event-based features such as Mouse Enter, Mouse Leave, Mouse Moved.
3. Minimal support for nonrectangular shapes.
4. Both Mac and Windows versions required for creating cross-platform projects.
5. Needs a better way of syncing graphics and time-based media elements such as sound and video.

What's Missing in Both Programs:

1. Alpha-channel masks for better composited graphics.
2. Better text options, including anti-aliased text, broader variety of formats, and text on a path.
3. Full AppleScript support to facilitate production automation.
4. Full support for QuickTime 2.0, including MIDI track and MPEG.
5. The kind of accurate and powerful placement tools found in page-layout programs.

developers can improve the performance that is experienced by end users.

Director 4.0 offers new features for memory management and optimization. By setting memory-purge priority (telling the Mac when to purge elements from RAM), for example, a developer can balance the load of media playback to make the best use of system resources, especially in systems with limited memory and a slow CD-ROM drive.

Both Director and Apple Media Kit "compile" their scripting languages into a compact, optimized "byte code" format. Each can create stand-alone applications that combine the elements and a player application with the media. For elements where speed is essential, a programmer can link in C code, although cross-platform titles require both a Macintosh and a Windows version of such custom code.

Cross-Platform Capability

ADVANTAGE: APPLE MEDIA KIT Both Director and Apple Media Kit offer Mac and Windows players. Apple Media Kit requires that you author on the Mac, but you can compile the results for playback on Macs and Windows-based machines. It features a cross-platform utility that checks media files for compatibility with the Windows platform and converts them, if necessary. You can create a multimedia title with Director on either a Mac or a Windows-based machine, since there are versions of Director for each platform. Both versions of Director create a proprietary binary file format that works on either platform, although a platform-specific player application (*projector,* in Director parlance) is required for each. Apple Media Kit has a similar cross-platform strategy, in that it creates run-time players for Macs and for Windows-based machines.



Apple Media Kit 1.1
Rating: ★★★★
List Price: $1,495.
Street Price: $1,495.
Pros: Excellent interface is easy for beginners to use. Scripting language is more powerful than Director's.
Cons: Scripting language is understandable only to object-oriented programmers.
Company: Apple Computer, Cupertino, CA; 800-776-2333 or 408-996-1010.



Macromedia Director 4.0
Rating: ★★★★
List Price: $1,195.
Street Price: $800.
Pros: All-in-one application for incorporating all types of media, painting, and animating. Powerful scripting language that can be learned with practice.
Cons: Must have both Mac and Windows versions of Director for cross-platform creations. Difficult interface.
Company: Macromedia, San Francisco, CA; 800-288-4797 or 415-252-2000.

Matching Tool to Task

ADVANTAGE: A DRAW When committing your project — or your entire career, for that matter — to a multimedia authoring application, don't just look at the different feature sets. First take a good look at your business model, what kind of people you'll be using in your projects, what kind of programming talent you can corral, and what level of complexity you'll be incorporating into your products.

Macromedia Director 4.0 is a good match if you have access to designers who either already know — or are willing and able to learn — Lingo. Director is also well suited to teams of designers and scripters that work closely together throughout the production process.

If you feel more comfortable with a traditional desktop-publishing production process, in which team members work within their own talent areas, Apple Media Kit is your best bet. In addition, the simplicity of AMT makes it a shoo-in for designers who can't deal with the Director interface, and AMT Programming Environment is powerful — in talented hands.

Patrick Milligan is an independent multimedia developer and the owner of Oakleaf Designs. Chris Okon is coauthor of *Demystifying Multimedia* (published by Apple Computer and vivid publishing, 1993).

More-technical information on scripting and a supplementary story on the future of cross-platform authoring (including ScriptX) are available on-line from ZiffNet/Mac. See page 4 for instructions on accessing ZiffNet/Mac.

Trends / easy-to-use, cross-platform

IN THE EARLY DAYS of filmmaking, the same enterprising person was just as likely to write the script, direct the actors, and crank the camera. Similarly, early multimedia development saw digital cowboys who could wrestle idiosyncratic scripting languages and stubborn tools and produce stunning results. Out of necessity, content production and programming were intertwined, and all energies were devoted to defining new frontiers and scrambling to find or invent the necessary tools.

Multimedia authors are changing. The dust in this industry is beginning to settle, and multimedia-work functions are growing increasingly specialized as development begins to break away from platform dependence. Mixed-blood artist/programmers are being outnumbered by a new breed of content artists who want tools that will help them focus on their craft, not drive them to the point of distraction. Authoring tools will become more flexible and efficient to meet the needs of the artist.

Divisions between platforms are blurring. The Power Mac and ScriptX are indications of this trend. Cross-platform capability is a necessary feature in tool design. But will it be enough to merely provide port-a-players, or is a more fundamental structure needed? The Power Mac will share the same processor as several Windows NT machines, and Kaleida's ScriptX cross-platform multimedia programming language is aimed at developers looking to take advantage of the various computer, gaming, and interactive-television platforms of the future. What's needed is a multimedia lingua franca, a common language that will allow the creation and sharing of content in many environments. Something like Kaleida's ScriptX may be the answer in that it may bring to multimedia what PostScript brought to desktop publishing: a common model for development and platforms. / Chris Okon

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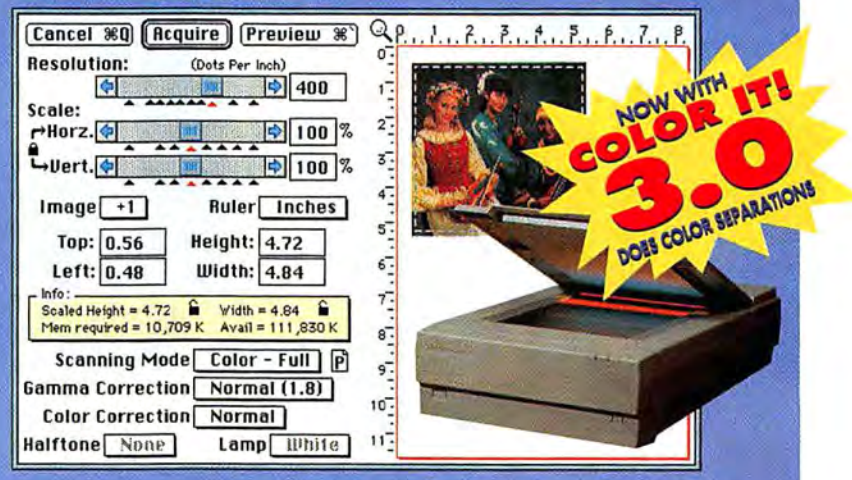
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MacUser ZD LABS

High-Capacity Hard Drives

Big Gigs

Multigigabyte drives are great bargains, but some may simply be too big for their own good — or yours.

By Peter Baum

For many users, the question is not whether to buy a gigabyte drive but how many. Most Mac owners, however, still think, A gigabyte hard drive? Isn't that more space than I'll ever need — or can afford? Maybe so; probably not.

The demands of today's software — color-image manipulation, professional publishing, digital video, multimedia, shared databases — have created storage needs unforeseen even a year ago. The lesson: When choosing a hard drive, don't think about what your storage requirements are today; think of what they'll be next year — then add a few hundred megabytes.

If you work with massive files created in Photoshop, Painter, or any of several 3-D-rendering or desktop-publishing applications, you're already in need of high-capacity storage. If you work with digital video or audio, you need high-capacity storage devices that can provide high sustained data rates — and gigabyte-and-larger drives are the fastest storage devices you can buy without sinking the family fortune into a costly disk-array or RAM drive. In fact, today's gigabyte drives have the lowest cost per megabyte of any drives we've ever seen. You can now find a well-built gigabyte drive for a lot less than $1,000, with some street prices breaking $800.

PHOTOGRAPHY / FRED STIMSON


Spin
Spin

In our most recent report on high-capacity drives for the Mac ("Heavyweight Hard Drives," July '93, page 92), the highest capacity available was 2 GB. At that time, a 1-GB drive cost around $2,000 and a 2-GB drive averaged $3,500. Times have changed, and the capacity ceiling has risen dramatically. Of the 45 drives we tested for this report, 23 have capacities higher than 2 GB, with the highest-capacity drives formatting to just under 9 GB.

If cost per megabyte is your sole concern, with a per-megabyte cost as low as 50 cents, a 9-GB monster may be your best buy. However, be wary about buying in to such a huge commitment: Backing up a 9-GB drive isn't a simple or fast chore, and you're committing a mountain of data to a single drive that will eventually fail — all hard drives do.

Drives don't last forever. It's not a question of if they will fail but when. Therefore, when we evaluate drives, we weigh considerations such as warranty and tech support heavily, since you are likely to use them sometime during your relationship with your drive. We highly recommend five-year warranties, such as those offered by APS, CMS, CORE, Glyph, and Lovièl. When possible, avoid one-year warranties, such as those offered by Apple and FWB. And make sure you get proper assurances from La Cie, MacWarehouse, PowerCity, and Spin: They offer different-length warranties for different drives and didn't include documentation on how long the warranties were for the drives they sent us.

The Players, The Tests

Of course, we didn't simply focus on future failure when evaluating drives. Such a decidedly pessimistic approach gives short shrift to the remarkable performance turned in by most gigabyte drives. To assess the effect of these high-speed drives on your day-to-day work, we tested their performance on tasks that rely heavily on drive use. First we rotated a 22-MB image in Adobe Photoshop, a popular disk-intensive application. We then played back a digitized full-screen, full-motion video captured with a Radius VideoVision Studio to see how well each drive performed in a digital-video application. Finally, we performed the comprehensive Disk Mix test from the Ziff-Davis MacBench 1.1 benchmark application (available on ZiffNet/Mac), which tests a broad range of drive activities and gives

The Bottom Line

MacUser/ZD LABS ENORMOUS CAPACITY and blinding speed are the hallmarks of the best big hard drives. If you're going to use a drive for storing larger color-graphics files or if you frequently work in digital-video production, then price and speed are your highest purchasing priorities. If speed is your main motivator and you own either a 68040 AV Mac or a Power Mac, stick with the drives under 4 GB — they're faster.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

1-to-1.6-GB Drives

		PRICE/ PERFORMANCE	CUSTOMER SERVICE	SOFTWARE AND DOCUMENTATION	CONSTRUCTION AND DESIGN
★★★★½	**Spin 1021**	⊕	⊖	●	●

MacUser RECOMMENDS

The fastest drive in this category — the Spin 1021 ($899 direct) — costs only $100 more than the least expensive drive we tested, the APS MS 1.0. As a company, Spin has some shortcomings, particularly in terms of tech support and formatting software, but the Spin 1021 drive itself is a killer.

★★★★	Apple 1050	●	⊖	⊕	●
★★★★	APS MS 1.0	●	⊕	●	●
★★★½	MacProducts Spitfire 1GB	●	●	●	●
★★★½	Microtech P1000	⊕	●	●	⊕
★★★½	Mirror Seagate 1075	●	●	⊕	●
★★★½	PowerCity PowerSTOR Quantum 1 GB	⊕	⊖	⊖	●
★★★	CMS Platinum Quantum 1GB	●	⊖	●	●
★★★	CORE SLM01000	⊖	●	●	⊖
★★★	Focus 1G	●	●	●	●
★★★	Glyph GHD-1200S	⊖	⊕	●	⊖
★★★	La Cie Joule 1080	●	●	●	⊖
★★★	Liberty 50 Series 1GB	●	●	●	●
★★★	MacWarehouse PowerUser Pro 1070	⊖	●	⊖	●

1-to-1.6-GB Drives, continued

		PRICE/ PERFORMANCE	CUSTOMER SERVICE	SOFTWARE AND DOCUMENTATION	CONSTRUCTION AND DESIGN
★★★	MacWarehouse PowerUser Pro 1226	●	●	⊖	●
★★★	Optima MiniPak 1000	⊖	●	●	●
★★½	CMS Platinum Micropolis 1GB	●	⊖	●	●

1.7-to-2.8-GB Drives

★★★★	**APS MS 1.7**	●	⊕	●	●

MacUser RECOMMENDS

Outstanding value is the hallmark of the MS 1.7 ($1,029 direct). It's not terribly fast, but its cost per megabyte is one of the lowest of the drives we tested. There are plenty of 2-GB drives that can outrun it, but almost all of them cost twice as much.

★★★★	**FWB PocketHammer 1760FMF**	●	●	⊕	●

MacUser RECOMMENDS

The Ferrari of hard drives, the FWB PocketHammer 1760FMF ($4,399 list, $3,600 street), is the fastest drive we tested. However, it also costs more than twice as much as the other drives and requires its own NuBus Wide SCSI-2 controller card.

★★★★	**Spin 2149**	⊕	⊖	●	●

MacUser RECOMMENDS

The quick and inexpensive Spin 2149 ($1,699 direct) was the second-fastest drive we tested and costs less per megabyte than all but two of the other drives. In our Photoshop test, it kept pace with the FWB PocketHammer 1760FMF — but for the cost of that speedster, you can get two Spin 2149 drives.

★★★½	Lovièl Lightning 2000	●	⊕	●	●
★★★½	MacProducts Seagate 2.1GB	●	●	●	●
★★★½	MacProducts Seagate 2.8GB	●	●	●	●
★★★½	Microtech P2000	●	●	●	⊕

Listing is alphabetical within groups of equal mouse ratings.

an overall profile of speed. All tests were conducted on a Quadra 840AV with 20 MB of RAM.

Since the fast data transfer of which these drives are capable can be highly susceptible to noise and signal attenuation, we also noted how much attention each vendor paid to details that ensure data integrity, such as cabling, termination, and case design and construction. Specifically, we were looking for twisted-pair cabling, active termination, and proper shielding and grounding.

We also evaluated the quality of the formatting software included with each drive — a significant part of the package, because it includes the driver software. We discovered that the speed of essentially identical mechanisms could vary by as much as 25 percent, due to variations in driver-software quality — and vendors that supply the better driver software don't necessarily charge more.

Unfortunately, high-speed drives expose the performance bottlenecks of all but the more recent Mac models. That is, unless you have a Power Mac or a 68040 AV Mac, you probably won't notice any speed differences among these drives: The faster ones are reduced to the performance of the slower ones by the limitations of earlier Macs' SCSI controllers. The Power Macs and the 68040 AV Macs have the fastest SCSI controllers of any Macs and take full advantage of Apple's new SCSI Manager, version 4.3. If you own or plan to upgrade to a Power Mac or a 68040 AV Mac, pay careful attention to our speed-test results and especially note which drives come with drivers that are SCSI Manager 4.3-compliant. If you own an earlier Mac, pay closer attention to price, construction quality, and whether the vendor offers the service and support you think you'll need.

1.7-to-2.8-GB Drives, continued

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	SOFTWARE AND DOCUMENTATION	CONSTRUCTION AND DESIGN
Mirror Seagate Barracuda 2.4	●	●	⊕	●
Mirror Seagate 2400	●	●	⊕	●
CMS Platinum II DEC 2GB	●	⊖	●	●
CORE SLM02000	●	●	●	⊖
Focus 2G	⊖	●	●	●
Liberty 70 Series 2.1GB	⊖	●	●	●
MacWarehouse PowerUser Pro 1801	●	●	⊖	●
MacWarehouse PowerUser Pro 2139	⊖	●	⊖	●
Mirror Quantum 1800	●	●	⊕	●
Optima MiniPak 2100	●	●	●	●
CMS Platinum Seagate 2GB	●	⊖	●	●
CMS Platinum II Seagate 2.8GB	●	⊖	●	●

2.9-to-9-GB Drives

All the capacity you'll ever need is available in these monster drives — but at a significant cost in speed and security. We recommend that instead of buying a massive, multigig hard drive, you satisfy your storage needs in increments of 2 GB. If — when — one drive goes down, you won't lose all of your data.

APS ST 9.0	⊕	⊕	●	⊕
APS ST 4.0	⊕	⊕	●	⊕
CMS Platinum II DEC 4GB	●	⊖	⊖	●
Mirror 9G	⊕	●	⊕	●
CORE SLM04001	⊖	●	●	⊖
FWB PocketHammer 4100FMF	●	●	⊕	●
Liberty 70 Series 4.2GB	●	●	●	●
Mirror 4G	●	●	⊕	●
Optima Concorde 9000	●	●	●	●

Plugging In, Playing

We started our evaluation by unpacking the drives and reading through the manuals. We looked for instructions on multidrive installation, since it's very likely that most people interested in purchasing a gigabyte drive will probably have several devices on their SCSI chains. None of the manuals were exceptional in this regard. Surprisingly, we couldn't find one that thoroughly covered all the cogent details, such as how to set the SCSI ID and how to terminate the drives in a multidrive configuration. Liberty and Lovièl had especially sparse manuals, considering the class of drives we were dealing with.

If a drive's manual isn't thorough, then hopefully the vendor has a sufficient number of folks sitting by the tech-support phones, ready to answer your questions. We called each company's tech-support line three times, with a different question each time, to see just how ready the staff really was. We found top-rated tech support at Glyph, Microtech, and Optima, whose staff answered all of our questions correctly and promptly. Apple, Mirror, PowerCity, and Spin either took more than a day to respond or answered one of our questions incorrectly. And as in hard-drive reports we've done in the past, the tech-support booby prize once again went to CMS for its 900 number, where tech support costs $10 per phone call. In our estimation, there's no reason to buy a drive from a vendor that has such an unfriendly policy.

Next, we plugged the drives in to our test Mac, set the SCSI ID and termination, and turned everything on. All but the CORE drives come with preformatted disks, which means you can use the drives right out of the box, thereby saving the time you'd spend formatting (as little as 20 minutes for some of the 1-GB drives to as much as 2 hours for some of the 9-GB ones). However, you may want to reformat the disk into multiple partitions to make backups easier, to better organize your work, or to reduce the maximum seek time for extremely search-intensive applications. Each partition appears as a separate volume on the desktop.

Drives larger than 2 GB run up against a peculiarity in Apple's operating system: Before System 7.5, the maximum size any disk partition could be was 2 GB; disks larger than that had to be split into multiple partitions. System 7.5 allows volumes as large as 4 GB, but individual files must still be 2 GB or smaller — even so, despite the demands of high-end video and audio, a 2-GB file is far bigger than most users will ever see.

MacWarehouse was the only vendor whose formatter could not create multiple partitions on a single disk. (The company claims this problem has been rectified in version 2.0 of its formatting software, which should be shipping by the time you read this.)

So, what's the advantage of buying a drive with a capacity higher than 2 GB? For one, even though a disk with more than 2 GB must be

figure 1

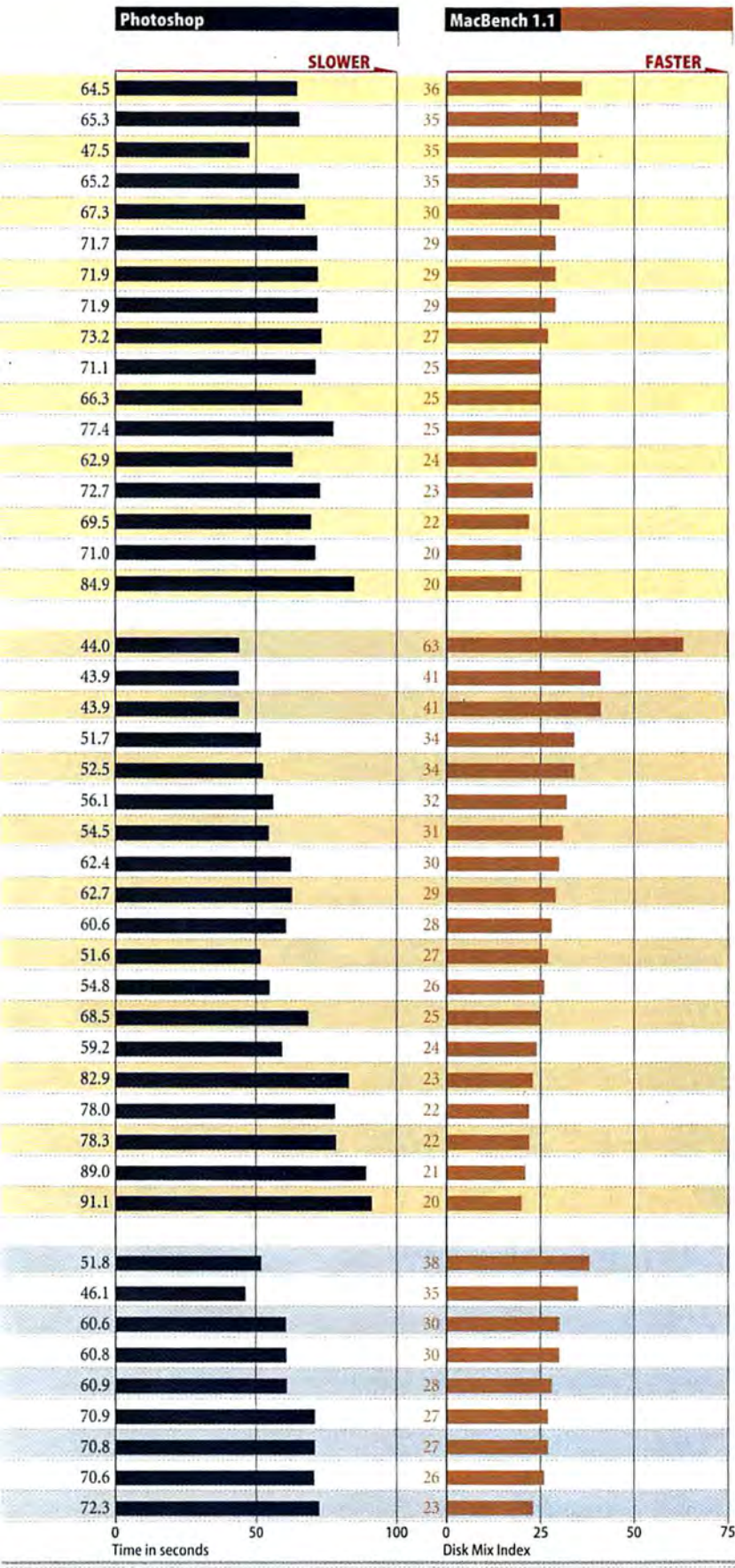
Points of Comparison / *the info you need for making a smart buy*

MacUser ZD LABS

	List price	Street price	Formatted capacity	Mechanism	Driver software
1-to-1.6-GB Drives					
Microtech P1000	$899	$899	1.028 GB	Quantum EMPIRE_1080S	Disk Force Utility 2.52q
CMS Platinum Quantum 1GB	$1,331	$1,150	1.028 GB	Quantum EMPIRE_1080S	SCSI Utility 7.3.1
✓ **Spin** 1021	$899	$899	1.019 GB	Digital DSP3107LS	Hard Disk ToolKit PE 1.5.1
PowerCity PowerSTOR Quantum 1 GB	$819	$819	1.028 GB	Quantum EMPIRE_1080S	Hard Disk ToolKit PE 1.5
APS MS 1.0	$799	$799	1.001 GB	Microp 4110-09TBCU0322B	APS Power Tools 2.8.1
Focus 1G	$1,189	$1,189	1.028 GB	Quantum EMPIRE_1080S	Drive 7 2.37
Liberty 50 Series 1GB	$1,299	$1,299	1.028 GB	Quantum EMPIRE_1080S	Hard Disk ToolKit PE 1.3.1
Apple 1050	$1,299	$1,299	1.028 GB	Quantum EMPIRE_1080S	Silverlining 5.5.4
La Cie Joule 1080	$879	$879	1.028 GB	Quantum EMPIRE_1080S	Silverlining 5.5.4/20
CMS Platinum Micropolis 1GB	$1,331	$1,110	1.000 GB	Microp 4110-09NB-Nov18b	SCSI Utility 7.4
Mirror Seagate 1075	$929	$929	1.004 GB	Seagate ST31200N	Hard Disk ToolKit PE 1.5
MacWarehouse PowerUser Pro 1226	$1,199	$1,199	1.168 GB	Quantum PD1225S	Spirit Utilities 1.40
MacProducts Spitfire 1GB	$800	$800	1.001 GB	IBM OEM 0662S12	Anubis 2.52q
MacWarehouse PowerUser Pro 1070	$1,099	$1,099	1.019 GB	Digital DSP3107LS	Spirit Utilities 1.40
Optima MiniPak 1000	*	$1,260	1.003 GB	Seagate ST11200N	DiskMount 2.7
CORE SLM01000	$1,199	$1,080	.999 GB	Fujitsu M2694ESA	CORE Formatter 3.3
Glyph GHD-1200S	$1,295	$1,090	1.004 GB	Seagate ST31200N	Glyph HD Utility 1.1
1.7-to-2.8-GB Drives					
✓ **FWB** PocketHammer 1760FMF	$4,399	$3,600	1.761 GB	Seagate ST12450W	RAID ToolKit 1.4
✓ **Spin** 2149	$1,699	$1,699	2.046 GB	Digital DSP3210S	Hard Disk ToolKit PE1.5.1
CMS Platinum II DEC 2GB	$2,959	$2,555	2.046 GB	Digital DSP3210S	SCSI Utility 7.4
Mirror Seagate Barracuda 2.4	$1,999	$1,999	2.038 GB	Seagate ST12550N	Hard Disk ToolKit PE 1.5
Microtech P2000	$1,937	$1,937	2.038 GB	Seagate ST12550N	Disk Force Utility 2.52q
MacProducts Seagate 2.1GB	$1,950	$1,950	2.038 GB	Seagate ST12550N	Anubis 2.52q
Lovièl Lightning 2000	$1,999	$1,999	2.038 GB	Seagate ST12550N	Anubis 2.52q
CMS Platinum Seagate 2GB	$2,811	$2,500	2.038 GB	Seagate ST12550N	SCSI Utility 7.4
Optima MiniPak 2100	*	$2,525	2.038 GB	Seagate ST12550N	DiskMount 2.7
✓ **APS** MS 1.7	$1,029	$1,029	1.683 GB	Microp 2217-15MQ1001901	APS Power Tools 2.8.1
CMS Platinum II Seagate 2.8GB	$3,403	$2,900	2.775 GB	Seagate ST15150N	SCSI Utility 7.4
MacProducts Seagate 2.8GB	$2,350	$2,350	2.773 GB	Seagate ST15150N	Anubis 2.52q
Mirror Quantum 1800	$1,199	$1,199	1.715 GB	Quantum PD1800S	Hard Disk ToolKit PE 1.5
Mirror Seagate 2400	$1,649	$1,649	2.046 GB	Seagate ST12400N	Hard Disk ToolKit PE 1.5
MacWarehouse PowerUser Pro 1801	$1,399	$1,399	1.715 GB	Quantum PD1800S	Spirit Utilities 1.40
CORE SLM02000	$2,229	$2,020	2.038 GB	Seagate ST12550N	CORE Formatter 3.3
MacWarehouse PowerUser Pro 2139	$2,399	$2,399	2.038 GB	Seagate ST12550N	Spirit Utilities 1.40
Focus 2G	$1,729	$1,729	1.683 GB	Microp 2217-15MQ1001901	Drive 7 2.37
Liberty 70 Series 2.1GB	$1,999	$1,999	2.046 GB	Seagate ST12400N	Hard Disk ToolKit PE 1.3.1
2.9-to-9-GB Drives					
FWB PocketHammer 4100FMF	$4,999	$4,075	4.091 GB	Seagate ST15150N	Hard Disk ToolKit 1.5.1
CMS Platinum II DEC 4GB	$4,365	$3,795	3.812 GB	Digital DSP5400S	SCSI Utility 7.4
APS ST 4.0	$2,899	$2,899	4.089 GB	Seagate ST15150N	APS Power Tools 2.8.1
Mirror 4G	$3,495	$3,495	4.090 GB	Seagate ST15150N	Hard Disk ToolKit PE 1.5
Liberty 70 Series 4.2GB	$3,899	$3,899	4.091 GB	Seagate ST15150N	Hard Disk ToolKit PE 1.5
Mirror 9G	$4,395	$4,395	8.628 GB	Seagate ST410800N	Hard Disk ToolKit PE 1.5
Optima Concorde 9000	*	$6,330	8.660 GB	Seagate ST410800N	DiskMount 2.7
APS ST 9.0	$4,299	$4,299	8.658 GB	Seagate ST410800N	APS Power Tools 2.8.0
CORE SLM04001	$4,389	$3,965	3.810 GB	Digital DSP5400S	CORE Formatter 3.3

✓ MacUser RECOMMENDS

*Optima does not provide list prices.



Test 'Em Yourself

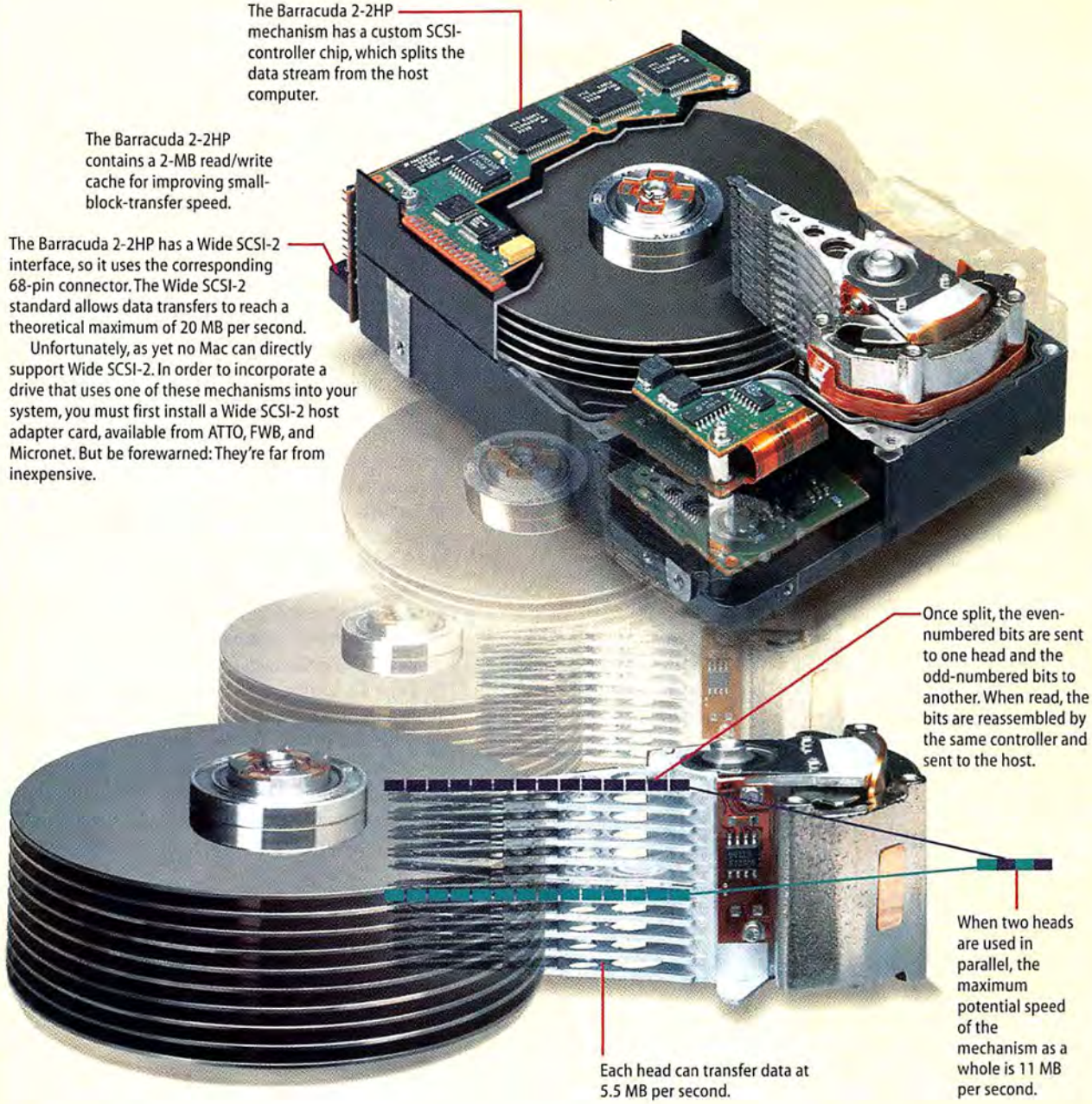
It's impossible to test every drive available, but with this figure and a copy of MacBench 1.1 from ZiffNet/Mac, you can get a clear picture of just how any drive we didn't get our hands on will stack up against those we did. If your local dealer carries a drive not included in this report, take along this figure and your copy of MacBench 1.1. Pay close attention to which mechanism the dealer says is inside the drive you're examining. Look in the figure for drives that use the same one, and you'll get a rough sense of what kind of performance you should expect. Run the Disk Mix test (remember, we ran our tests on a Quadra 840AV, so your results may be a little different) on the drive you're interested in. If the dealer has a drive we did test, run the Disk Mix test on it just so you get an idea of the speed difference caused by the Mac it's connected to. Then compare both results with those in the MacBench 1.1 chart shown here. This should give you a clear picture of how your dealer's drive stacks up against those in this report.

The drives in these charts are ranked in order of overall performance for each size category. If you look closely, you'll notice that in many cases, drives that use the same mechanism received different scores in our speed tests. The reason is that the drives use different drivers. The drivers dictate which features of the mechanism (such as write caching) are engaged and which are not. Drives that come with drivers that engage write caching are always faster than those that don't. A driver can also enable a drive to take advantage of certain features of Apple's new SCSI Manager 4.3, such as asynchronous transfers. Drives shipping with 4.3-compliant drivers are especially useful for digital-video users — particularly those people using QuickTime 2.0. Since drives with noncompliant drivers must access the new SCSI Manager through emulation, they cannot support high data-transfer rates, and thus digital video is of a poorer quality or can be captured only at lower frame rates.

To get an idea of the difference a driver can make, look at the results of the Spin 1021 and the MacWarehouse PowerUser Pro1070. These drives use the same mechanism, but the Spin drive is much faster, because its driver is 4.3-compliant and it activates the mechanism's write cache.

How It Works / parallel read and write channels

THERE'S A NEW BREED OF HARD DRIVE that's pushing the limits of just how fast a drive can be. The first examples of this next performance wave are drives that use Seagate's *two-head-parallel* technology. The basic idea is to split the data stream between two heads, instead of writing to one head at a time. Theoretically, you can double the speed of reads and writes. But this is more than just a cool idea — it's available today. This example shows a Seagate Barracuda 2-2HP, which has a capacity of 2 GB.



As a rule, most Macintosh applications transfer data in fairly small chunks. So specs such as sustained throughput seldom mean much in terms of making Macintosh applications run faster. Notice in our Photoshop test that the Spin 2149 and the FWB PocketHammer 1760FMF took virtually the same time. The Spin 2149's Digital mechanism spins its platters slower than does the Seagate mechanism in the FWB PocketHammer 1760FMF, it has a smaller cache, and it doesn't use two-head-parallel technology. So why is the mechanism as fast?

Well, for one thing the Digital mechanism has a very good caching algorithm and a powerful processor running that cache. The cache on the Digital mechanism is divided into segments that closely match the size of the data chunks most Mac applications like to pass. This means that when an application requests data from the drive, there's a very good chance that data will be waiting in the cache.

partitioned into multiple volumes (unless you're using System 7.5 or later), it still requires only one SCSI ID. On the minus side, however, when the drive fails, you lose access to all partitions on the disk. Buying two drives increases your chances that at least one will always be working.

Not Just Big, but Fast

First we performed our real-world Adobe Photoshop test, and then we compared each drive's result with its score in the MacBench Disk Mix test. Not surprisingly, the results were very similar: Those drives that did well in the Photoshop test also did well in the Disk Mix test (see figure 1).

In our digital-video test, we digitized a single video clip at three data rates — 3, 3.5, and 4 MB per second — and then analyzed the playback of those clips on each drive, checking for dropped frames. Again, the importance of using the new SCSI Manager, version 4.3, was apparent: None of the drives that shipped with drivers that were not compliant with SCSI Manager 4.3 were able to pass even the 3-MB-per-second test.

As mentioned earlier, driver software is critical to optimal drive performance. The two driver variables that had the most significant impact on speed were SCSI Manager 4.3 compliance and write caching. When it comes to improving speed, the use of read and write caches is essential. All the mechanisms in the drives we tested offered some sort of read and write caching. Unfortunately, many of the drivers shipped with the drives didn't allow users to turn write caching on. Many mechanisms do not come with write caching enabled by default, so if the driver software doesn't allow you to turn it on, you'll always be operating your drive at less than maximum speed. The drives that came with drivers that didn't enable write caching were all the drives from Apple, CORE, Focus, MacWarehouse, and Optima as well as all the CMS drives except for the Platinum Quantum 1GB; all the Liberty drives except for the 50 Series 1GB; and all the Mirror drives except for the Quantum 1800 and the Seagate Barracuda 2.4.

The top performers span the capacity range from 1 to 4 GB. All but the first-place drive (based on a Seagate mechanism) use Digital mechanisms. Here's how they shook out: The FWB PocketHammer 1760FMF was the fastest in all tests except the Photoshop rotate, where it performed nearly identically to the Spin 2149.

The PocketHammer 1760FMF was the fastest for two main reasons: First, it was the only Wide SCSI-2 drive we tested. Of the 45 drives we tested for this report, only the FWB PocketHammer 1760FMF takes advantage of Wide SCSI-2 technology, which transfers 16 instead of the standard 8 bits at a time, greatly improving speed. However, Wide drives require a separate controller card (in the PocketHammer 1760FMF's case, the FWB JackHammer Wide SCSI-2 card), since the Mac does not directly support Wide SCSI-2. The rest of the drives connect directly to the Mac's SCSI port. The advantage of the Wide SCSI-2 interface is that data transfers between the drive and the Mac occur much faster than with standard SCSI-2 devices — especially useful when data transfers occur between the Mac and the cache on the disk.

The second reason for the PocketHammer 1760FMF's high speed was that it was the only drive we tested whose mechanism offered parallel read and write channels — that is, the drive can move data through more than one head at a time. The combination of these two technologies makes for a lightning-fast drive. Although it was the fastest drive in our tests, it was unfortunately also the most expensive of its size *and* the JackHammer card it requires for connection to a Mac adds $600 to the drive's price.

Tied for second place were the CMS Platinum II DEC 2GB and the Spin 2149, which use the same Digital DSP3210S mechanism. These two drives, although using different drivers, performed almost identically in our speed tests. The Spin 1021 and the CMS Platinum II DEC 4GB, which use different Digital mechanisms (the Digital DSP3107LS and DSP5400S, respectively), were tied for third place.

Each of these five drives comes with a driver that supports write caching and is compliant with SCSI Manager 4.3. Other vendors ship models that use the same mechanisms as the third-place drives, but their drivers don't support either write caching or SCSI Manager 4.3, so the drives are significantly slower.

Interestingly, all the top-rated Digital mechanisms have slower spin rates (5,400 rpm) and smaller caches (512K) than many of the Seagate mechanisms (7,200 rpm and 1 MB) they outperformed, proving yet again that raw drive specifications can be misleading. The efficiency of a drive's cache algorithm is a more important factor in evaluating drive performance than either the rotational speed or the cache size.

Ripping It Open

Fast is good, but so is strong. To analyze the drives' design and construction, we took out our screwdrivers and knives and opened up cases and cables. When examining the drive enclosures, we looked for details such as how termination was provided, whether the drive

Trends / Apple offers improvements

APPLE IS MAKING CHANGES to the way data is transferred between a Mac and its SCSI devices. Apple's new SCSI Manager, version 4.3, in concert with faster SCSI controllers on new 68040 AV Macs and the Power Macs, means potentially higher data-transfer rates. If you have one of these Macs, make sure the drivers you use take full advantage of the new SCSI Manager. And keep your eyes open for QuickTime 2.0, which, with the new manager, really takes advantage of these faster SCSI controllers.

Asynchronous transfers will liberate the CPU. Apple's SCSI Manager 4.3 is also being used in new 68040 Macs, such as the new 630 series. Although these Macs don't support hardware DMA (direct memory access) on the SCSI port, as do the AV Quadras and all Power Mac machines, they do support SCSI Manager 4.3's asynchronous-transfer abilities, which frees up the processor while data is being fetched from the hard disk. QuickTime 2.0 takes advantage of this feature, for example, by prefetching future video frames from the disk while processing the current frames.

Apple will improve SCSI speed. One reason the fastest drive in this report, the FWB PocketHammer 1760FMF, is so speedy is that it bypasses the Mac's SCSI port and hooks up to the Mac through FWB's JackHammer NuBus card. Apple has started to eliminate the SCSI bottleneck by doubling the rate at which Power Macs such as the 8100 can transfer data over their internal SCSI bus — expect more improvements in the future. If you own a Power Mac 8100 and need faster drive speed, consider adding an internal drive.

figure 2

Features of High-Capacity Hard Drives / *1-to-1.6-GB drives*

	Apple 1050	APS MS 1.0	CMS Platinum Micropolis 1GB	CMS Platinum Quantum 1GB	CORE SLM01000	Focus 1G	Glyph GHD-1200S	La Cie Joule 1080	Liberty 50 Series 1GB	MacProducts Spitfire 1GB	MacWarehouse PowerUser Pro
AC outlets						●		●		●	
Switchable active termination		●						●	●		
50-pin SCSI connectors	●	●	●	●	●	●	●		(25-pin)	●	●
Power light	●	●	●	●	●	●	●	●	●	●	●
Access light		●	●	●	●	●	●	●	●	●	●
FCC Class B certification	●	●	●	●	(Class A)	●	●	●	●	●	●
SCSI Manager 4.3-compliant		●	●	●						●	
Partitioning software	●	●	●	●	●	●	●	●	●	●	
Backup software			●	●							
Password protection	●	●	●	●	●	●		●	●	●	
Encryption			●	●							
File recovery			●	●							
Five-year warranty		●	●	●	●		●	●		●	
Toll-free tech support	●	●				●		●			●
Money-back guarantee	†	●				●		●	●	●	●
Loaner drives available	†				●	●			●		

✓ MacUser RECOMMENDS

*Five-year warranty on mechanism only.

†Dealer may choose to offer this service.

figure 3

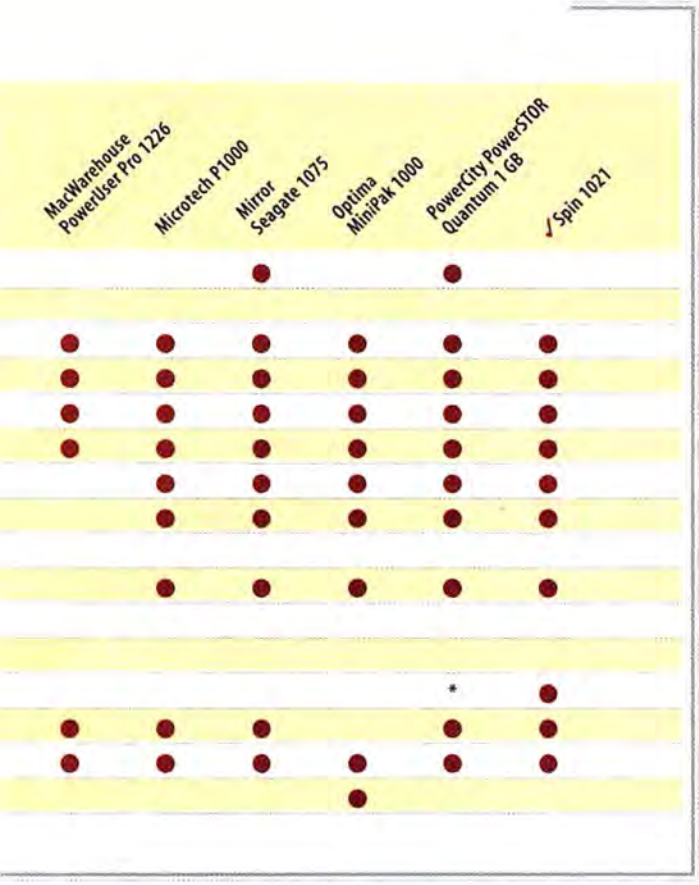
Features of High-Capacity Hard Drives / *1.7-to-2.8-GB drives*

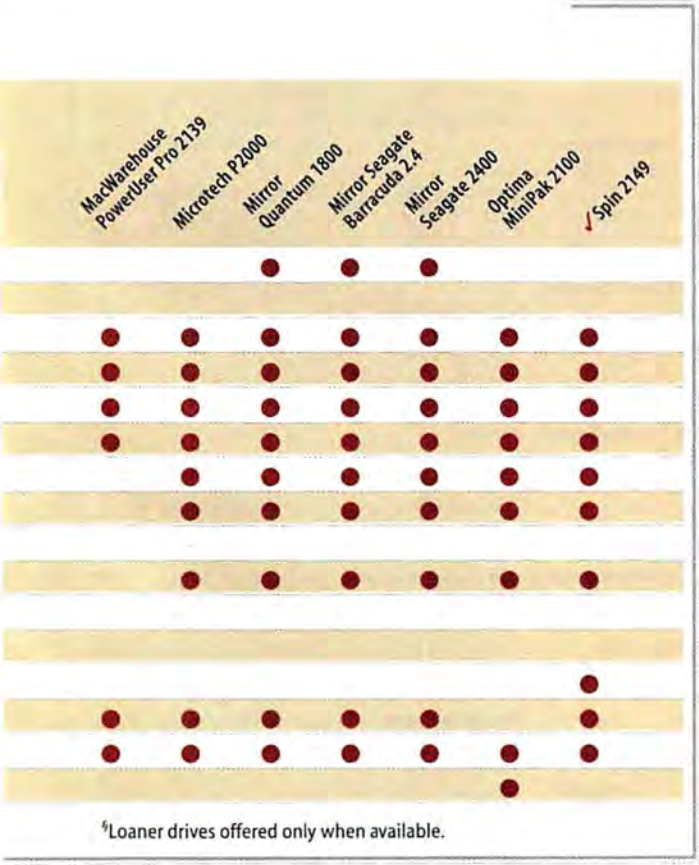
	✓APS MS 1.7	CMS Platinum Seagate 2GB	CMS Platinum II DEC 2GB	CMS Platinum II Seagate 2.8GB	CORE SLM02000	Focus 2G	✓FWB PocketHammer 1760FMF	Liberty 70 Series 2.1GB	LoviéI Lightning 2000	MacProducts Seagate 2.1GB	MacProducts Seagate 2.8GB	MacWarehouse PowerUser Pro 1801
AC outlets						●			●	●		
Switchable active termination	●						*	●				
50-pin SCSI connectors	●	●	●	●	●	●	†		●	●	●	●
Power light	●	●	●	●	●	●	●	●	●	●	●	●
Access light	●	●	●	●	●	●	●	●	●	●	●	●
FCC Class B certification	●	●	●	●		●	●	●	●	●	●	●
SCSI Manager 4.3-compliant	●	●	●	●			●		●	●	●	
Partitioning software	●	●	●	●	●	●	●	●	●	●	●	
Backup software		●	●	●								
Password protection	●	●	●	●	●	●	●	●	●	●	●	
Encryption		●	●	●			●					
File recovery		●	●	●								
Five-year warranty	●	●	●	●	●				●	●	●	
Toll-free tech support	●					●						●
Money-back guarantee	●					●		●	●	●	●	●
Loaner drives available					●	●	§	●	●			

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*Active external termination is provided.

†Includes 68-pin connector for Wide SCSI-2.





[6]Loaner drives offered only when available.

was FCC Class B-certified, and the amount of shielding around the power supply.

APS, La Cie, and Liberty deserve praise for supplying switchable active termination — either analog or digital — which helps to ensure reliable data transfer and requires only a flick of a switch to set.

The APS, FWB, Liberty, and Optima drives come in small, portable cases, measuring less than 8 x 6 x 2.5 inches — convenient for those who plan to carry their drive around. The Liberty drives, the smallest of the bunch, add the convenience of a battery option — perfect for the network manager who must hustle around the office installing software. To achieve the small size, however, Liberty uses a 25-pin connector (like the SCSI connector on the back of the Mac) and not the standard 50-pin connector of most external drives.

At MacUser Labs, we've always frowned on the use of 25-pin connectors, because they don't offer the proper grounding that provides the highest level of data integrity. Well, it's time we focused on Apple and its insistence on using 25-pin connectors on its computers. If Apple is serious about taking advantage of high-speed storage devices and providing hardware that supports disk-intensive software, it needs to face the fact that a 25-pin connector is no longer acceptable. Anything less than a 50-pin connector offers an unreasonable risk for users' data.

Of all the drives we tested for this report, only the CORE drives were not FCC-certified as Class B computing devices. Class B certification is required for a device to be sold in the home or home-office market. Class A devices may emit higher levels of radio-frequency radiation, which can interfere with radio and TV signals — and the navigation system of the 747 landing nearby.

For the money you spend on these drives, you ought to get the very best SCSI cables: fully grounded 50-pin connectors with signal lines twisted and paired and with the ground lines around them. The internal lines should be shrouded in a foil shield and a wire braid. The drives from CMS, CORE, and Liberty and the Focus 2G drive came with cables that lacked twisted-pair lines, however. If you buy one of these drives, you owe it to yourself to spend another $25 on a good, reliable SCSI cable.

What to Buy — and How Many

Smart buyers will buy a drive that matches their system configuration and needs. There's no need to pay extra for performance you can't use — if you own a Mac IIfx, say, and have no plans to upgrade. Also, if you aren't using disk-intensive applications, the same rule applies.

Think ahead when figuring out how much capacity you need. The price difference between a 1- and a 2-GB drive can be as little as $250. But if you're buying a 2-GB drive, carefully consider whether you'll use that extra gigabyte within a year. As prices continue to plummet, the money you save by not buying that extra gigabyte today will go a long way toward a different drive next year.

If speed is of the essence, particularly if you work with desktop-video applications, don't even consider looking at a drive that comes with a driver that is not compatible with Apple's new SCSI Manager 4.3. Even if the Mac you're using today doesn't support it, your new Mac will tomorrow.

If you're looking for storage capacity of 4 GB or more, you are

figure 4

Features of High-Capacity Hard Drives / *2.9-to-9-GB drives*

	APS ST 4.0	APS ST 9.0	CMS Platinum II DEC 4GB	CORE SLM04001	FWB Pocket-Hammer 4100FMF	Liberty 70 Series 4.2GB	Mirror 4G	Mirror 9G	Optima Concorde 9000
AC outlets		●					●		
Switchable active termination	●	●				●			
50-pin SCSI connectors	●	●	●	●	●		●	●	●
Power light	●	●	●	●	●	●	●	●	●
Access light	●	●	●	●	●	●	●	●	●
FCC Class B certification	●	●	●		●	●	●	●	●
SCSI Manager 4.3-compliant	●	●	●		●	●	●	●	●
Partitioning software	●	●	●	●	●	●	●	●	●
Backup software			●						
Password protection	●	●	●	●	●	●	●	●	●
Encryption			●		●				
File recovery			●						
Five-year warranty	●	●	●	●					
Toll-free tech support	●	●					●	●	
Money-back guarantee	●	●				●	●	●	●
Loaner drives available				●	*	●			●

*Loaner drives offered only when available.

better off buying increments of 2 GB. The 4- and 9-GB drives are relatively slow, and the equivalent capacity in 2-GB drives doesn't cost much more. Also, if you buy four 2-GB drives and one of them dies, you lose only 2 GB of data; if you buy a 9-GB drive and it dies, you lose everything.

If you must buy a 4-GB drive, take a close look at the APS ST 4.0. The driver APS shipped when our testing was conducted was not compliant with SCSI Manager 4.3, but by the time you read this, version 3.01 of its formatting software will be shipping, and it is compliant. If you already own an APS drive and have a Mac that uses the new SCSI Manager, update your driver.

If you absolutely, positively need 9 GB in a single box — if, for example, you're low on SCSI-ID numbers — you should look at the APS ST 9.0, which offers the best value of the 9-GB drives we tested. If your SCSI chain is not already overloaded, however, we recommend buying four separate drives if you need 9 GB. Four APS 1.7-GB drives will give you almost the same amount of storage, run faster, be easier to back up, be safer, and cost $180 less.

No matter which drive you choose, pay attention to the warranty. Many low-cost drives have five-year warranties — and at the rate drive prices are dropping, when your warranty runs out, you can probably buy a blindingly fast multigigabyte drive for the same price as a one-year extended warranty.

Peter Baum is HyperCard Forum Leader on America Online and a Mac consultant currently working on voice-mail, fax-back, and network-fax solutions for the Mac. Kristina De Nike, a project leader at ZD Labs, managed the testing for this report.

MacBench 1.1, the benchmark software used to test the hard drives for this report, is available on-line on ZiffNet/Mac. See page 4 for instructions on accessing ZiffNet/Mac.

Directory / vendors of hard drives tested

Apple Computer
Cupertino, CA
800-233-4846
408-996-1010

APS Technologies
Kansas City, MO
800-235-2753
816-483-6100
816-483-3077 (fax)

CMS Enhancements
Irvine, CA
800-788-4267
714-222-6000
714-222-6310 (fax)

CORE International
Boca Raton, FL
800-920-2673
407-997-6055
407-997-6009 (fax)

Focus Enhancements
Woburn, MA
800-538-8866
617-938-8088
617-938-7741 (fax)

FWB
San Francisco, CA
415-474-8055
415-775-2125 (fax)

Glyph Technologies
Ithaca, NY
800-335-0345
607-275-0345
607-275-9464 (fax)

La Cie
Beaverton, OR
800-999-0143
503-520-9000
503-520-9100 (fax)

Liberty Systems
San Jose, CA
408-983-1127
408-243-2885 (fax)

Lovièl
Minneapolis, MN
800-688-3696
612-828-6880
612-828-6881 (fax)

MacProducts USA
Austin, TX
800-622-3475
512-476-5295
512-476-6399 (fax)

MacWarehouse
Lakewood, NJ
800-255-6227
908-367-0440
908-905-9279 (fax)

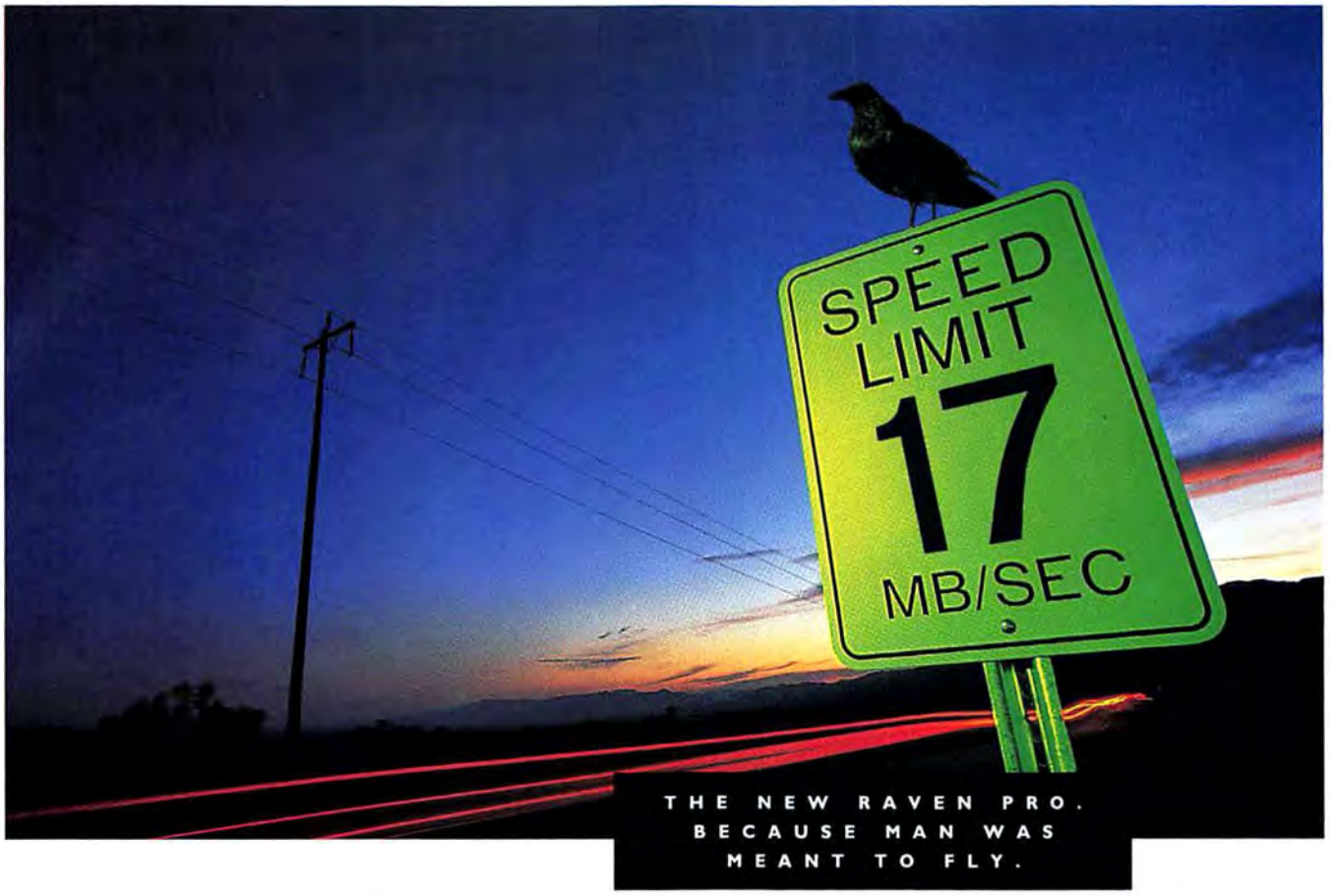
Microtech International
East Haven, CT
800-626-4276
203-468-6223
203-468-6466 (fax)

Mirror Technologies
Minneapolis, MN
800-654-5294
612-270-2718
612-832-5709 (fax)

Optima Technology
Irvine, CA
800-367-3787
714-476-0515
714-476-0613 (fax)

PowerCity
Deerfield Beach, FL
800-376-9372
305-420-0369
305-420-0282 (fax)

Spin Peripherals
Newton Upper Falls, MA
800-466-1200
617-965-9882
617-965-6257 (fax)



When it comes to performance, the sky should be the limit—not your equipment. Introducing the Raven Pro disk array, our next-generation flying machine. Now you can open a 480 MB Photoshop file with lightning speed. Transfer dailies without losing a single frame. Gain access to mirrored business-critical data in less than 8 ms or mix and match RAID levels and partitions to meet your specific needs. With 17.2 MB/sec throughput and up to 52 GB on-line capacity, they're four times faster and have 104 times the capacity of the native 500 MB drive you're probably using now. To find out what Raven Pro can do for your company's throughput, call 1-800-800-DISK. Then let your imagination and productivity take flight.



Raven Pro

Raven's flexible utility program allows you to optimize drive caching and each partition's parameters, including location on disk and block size for maximum application performance.

Raven Pro disk arrays offer a flexible upgrade path for all high-powered Macintosh systems via PDS, NuBus or software. PDS and NuBus versions provide a 32-bit data path via Fast/Wide SCSI-2.

MicroNet's Raven Pro is the newest addition to our family of award winning storage solutions. Based on proven Raven technology, it takes the science of disk array engineering to an unprecedented level.

MicroNet

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While many of the names in today's scanner market were still making computers, laser printers...or even radios, of all things, Microtek was racking up an impressive array of firsts in scanners.

Microtek brought the first halftone desktop scanner to market in 1984. Microtek was also responsible for the first 256-tone grayscale scanner, the first affordable desktop color scanner and the first affordable 35mm slide scanner. With the recent introduction of Dynamic Color Rendition (DCR), Microtek produced the first automated color calibration and correction system. And now, with the ScanMaker III and ScanMaker 45t, we're the first to market with honest 36-bit desktop color scanners.



Microtek's Family of Scanners includes: ScanMaker III, ScanMaker IIHR, (both shown with optional transparency adapter), ScanMaker 45t, ScanMaker IISP and ScanMaker II.

Affordable Quality.

Don't need color scanning capabilities? Then don't buy them. The Microtek ScanMaker IIG is a great 300 x 600 gray-scale scanner with a street price starting around $400.

Want color but still don't want to spend big bucks? Look into the ScanMaker II – you get 24-bit color flatbed scanning *and* Adobe Photoshop LE for around $550.

Looking for a fast, single-pass scanner for office and graphic applications? The ScanMaker IISP is the winner of two important Editors' Choice Awards from *PC Magazine* and from *Imaging* magazine. It has software enhanced resolution of up to 1200 x 1200 and a street price of around $750.

For more sophisticated applications, there's the ScanMaker IIHR. You'll get software enhanced resolution up to 2400 dpi — which makes it very popular with



PRINTERS. ALL WE MAKE ARE THE BEST SCANNERS YOU CAN BUY.

PC MAGAZINE EDITORS' CHOICE February 8, 1994 Microtek ScanMaker IISP

IMAGING MAGAZINE EDITORS' CHOICE

graphic artists — and a price of around $1100, which makes it very popular, period.

68 BILLION COLORS.

With 36-bit color resolution, the ScanMaker III and ScanMaker 45t are working with far more data than any 24- or even 30-bit scanners. A palette of 68-billion colors means unparalleled richness and depth, clarity of detail and color accuracy that rivals machines costing much more.

The ScanMaker III is a fast, single-pass flatbed scanner with DCR color calibration, software enhanced resolution up to 2400 dpi and a street price under $2700.

You read it right, under $2700.

For real high-quality work, the ScanMaker 45t offers photographers and graphic artists up to 2000 x 2000 dpi software enhanced resolution for scanning transparent images up to 5" x 5". It costs about $6500 and offers a level of quality that – until now – was only available to professionals using costly drum scanners.

FIRST NAME IN VALUE.

No matter how much money you have to spend, you'll find your best value is with Microtek. For example, most Microtek scanners come with Adobe Photoshop or Adobe Photoshop LE at no extra cost.

Microtek is the world's largest desktop scanner manufacturer. We've made more scanners, longer, and have a history of more scanner awards and innovations than anyone else you can name. And since we don't divide our attention between computers, printers and miscellaneous consumer products, we can concentrate on making the finest products in the scanning business. For your free copy of our scanning primer *The Scanned Image*, more information about scanners and Microtek in particular, just call us at 800 654-4160 or fax a request to 310 297-5050.

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Before you buy a scanner, let's talk.
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CIRCLE **159** ON READER SERVICE CARD

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CIRCLE **108** ON READER SERVICE CARD

IMAGE EDITING /

FAUVE TAMES WILD IMAGES

A TINY UPSTART company that's known for a PC paint program is preparing to take on the Mac image-editing heavyweights by promising real-time manipulation of files as large as 1 GB. In some ways, the feature set of Fauve Software's xRes reads like a grab bag of tools culled from Adobe Photoshop, Fractal Design Painter X2, and HSC Software's Live Picture, but xRes offers some innovative features as well.

Like Live Picture, xRes converts images



into a proprietary format that stores image data along with command instructions, so the application pays attention only to the area on which you're working. Processing is delayed until you save as a TIFF file. As a result, you can work quickly without waiting for the entire image to update and brushes as wide as 1,000 pixels operate in real time.

As with Painter and Fauve's PC package, Matisse, xRes brushes simulate natural-media effects such as charcoal, oil, and airbrushes on a variety of paper textures. A powerful gradient picker akin to the gradient designer in Kai's Power Tools gives you much more flexibility in applying blends.

Much of Photoshop's image-handling prowess is here as well, including CMYK editing, filters, color-correction tools, and channel operations. xRes also accepts standard Photoshop plug-ins and allows multiple floating layers, each of which can be several hundred megabytes in size and contain as many as 32 channels.

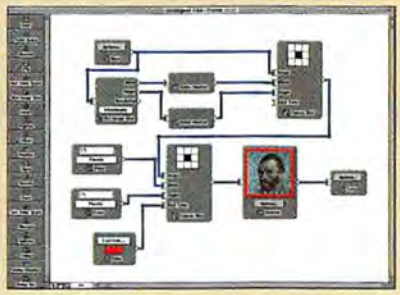
But unlike Photoshop, xRes permits multiple levels of undo and redo and lets you tag sets of operations for undo. A closed-loop calibration system converts colors selected in the xRes RGB palette to CMYK on the fly, giving you a better match between on-screen and printed colors.

Best of all, xRes requires only 8 MB of RAM, and it's priced at just $795. Look for the 680x0 version this month, with a Power Mac version slated for year's end. 800-898-2787 or 919-380-9933. / Sean Safreed

Be a Master Batcher

SIZING, SCALING, and sharpening a pile of image files can be a bore. Artists who routinely perform the same graphics tasks should find relief in Gryphon Software's Batch It! automatic batch-processing application.

Based on a tile paradigm, Batch It! lets you link specific functions — such as image rotation, color correction, and format conversion — into one operation. Dragging a file onto a tile initiates the sequence. Because not all of its 30 functions work together, Batch It! indicates



by color which tiles can be connected.

Batch It! supports file formats such as TIFF, PICT, and Adobe Photoshop as well as allowing access to other formats through Apple's Easy Open extension. $199. 619-536-8815. / Pamela Pfiffner



When You Need Fonts and Graphics *Now*

AS ITS NAME SUGGESTS, International Typeface Corp. (ITC) is famous for its fonts. But that's changing this fall, when ITC's ambitious new graphics-distribution product, ITC Design Palette, goes on-line.

Design Palette puts a new spin on current techniques for on-demand distribution of fonts, graphics, and publishing utilities. Unlike unlockable CD-ROMs or on-line databases, each of which requires an operator on the other end to authorize access codes or arrange image transfers, Design Palette is truly automatic: Establishing a line of credit with ITC lets you preview items from an encrypted CD-ROM. Click on the Buy button, and the item is instantly loaded onto your hard disk. You simply pay a monthly bill.

How does it work? The brains of the operation is a box containing a 2,400-bps modem that connects to a phone line and to your Mac's SCSI port. The box handles decryption and records transactions. Late each night, ITC's computer polls the hardware device to measure usage. The Design Palette package includes a suite of CD-ROMs that are updated quarterly free of charge as well as software that lets you browse the CD-ROM contents. Currently, Design Palette offers fonts from Agfa, Adobe, and Emigré; graphics from PhotoDisc and Clement Mok Designs; Quark XTensions and Photoshop plug-ins; and other goodies.

In a refreshing twist, ITC doesn't charge for the setup; you pay a $75 application fee and agree to purchase a minimum of $200's worth per month. 212-371-0699. / PP

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CIRCLE **121** ON READER SERVICE CARD

Screening Schemes

The prepress community is abuzz these days about stochastic screening as an alternative to traditional halftones. So what is stochastic screening, and what can it do for you? BY STEVE HANNAFORD

WHEN DINOSAURS ruled the earth. To the uninitiated, that's what the word *stochastic* may conjure up, but in the world of design and prepress, *stochastic screening* doesn't refer to an ancient era. It's the future of printing.

Stochastic screening is an alternative to the conventional halftone process, in which continuous-tone images such as photographs are converted to dots for reproduction by printing presses. Derived from the Greek, *stochastic* loosely means learning by trial and error. More recently, as used in mathematics and music theory, it tends to mean *random* or *by chance*. It's hard to imagine how the tightly controlled world of print production, which already has to deal with variables of ink, paper, operator, and machine, would welcome another wildcard.

But stochastic screening isn't really random, and its ability to reproduce images with the fidelity and tonal range of continuous-tone images is making designers, photographers, and publishers take notice.

So what is stochastic screening, anyway? Some background might help.

Halftones and PostScript

The traditional halftone process simulates gradations of color by breaking up photographic images into dots of variable sizes on a precise grid. Our eye sees the dots, but our brain fuses them into specific tones. In a halftone, an area of shadow has larger dots, and an area of highlight has smaller dots. The distance between the centers of the dots — called the halftone frequency — remains constant within an image and is measured in lines per inch (lpi). The higher the halftone frequency, the closer the dots are spaced and the crisper the image.

Stochastic screening flies in the face of convention. Instead of varying the size of the dots, stochastic screening varies their spacing, or frequency, to represent intensity levels (see figure 1). The darker the color, the more spots in the area. Stochastic screening is more appropriately called Frequency Modulation (FM) screening, and as a result, some pundits now call the conventional approach to making halftones Amplitude Modulation (AM) screening, because the size (amplitude) of the dots changes. Yet another emerging branch of stochastic screening — called Second Order Stochastic — combines AM and FM techniques.

Stochastic screening is not a new idea — pilot programs existed at traditional prepress, printing, and equipment companies years ago — but creating good stochastic screening is complex and demanding. Only

HIGHFALUTIN DITHERING / *make your own stochastic screens*

YOU CAN FAKE a stochastic halftone in Adobe Photoshop by using the following technique, from graphic-arts consultant Brian Lawler:

1. Open a color photograph in Photoshop, and convert it to CMYK. Save it as a DCS file (EPS-5) with color preview. You now have five files: a preview image and four separate color files designated as filename.C, filename.M, filename.Y, and filename.K.

2. Reopen each file individually, and then convert each one to a bit map (Mode: Bitmap), using the Diffusion Dither method. Set the resolution to a value that is evenly divisible into the resolution of the imagesetter on which the file will be printed (for example, 600 dpi divides evenly into 3,600 dpi). Values of about 600 yield reasonable file sizes whose smallest print spots will hold on a common offset printing plate.

3. Save each bit-map file as an EPS document in the same folder as the DCS version and append a 1 onto each new file's name, so you have filename.C1, filename.M1, and so on. When saving the files in EPS format, do not check the box for Transparent Whites.

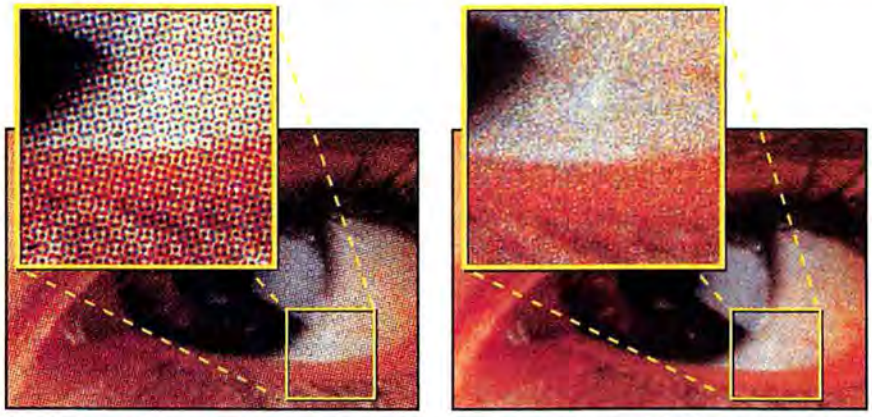


IMAGE COURTESY OF PETER A. GOULD © 1994

4. Now, back in the Finder, swap filenames with those of the real DCS component images so that filename.C1 becomes filename.C. (One way is to append a 2 onto the name of each original CMYK file and then delete the 1s from the second batch.)

5. Create a document in QuarkXPress or PageMaker, and place the DCS preview image. Print the color separations to the imagesetter. The layout program will download the renamed EPS files, ignoring the original DCS files. The result is an automatically separated dotless image printed with a four-color process quite similar to what you'd get with the high-end stochastic-screening technology on the market today.

Note: Because stochastic screening has the potential for greater midtone dot gain than in the same image printed as a conventional halftone, you need to experiment with Photoshop's Curves control (Image: Adjust: Curves) to compensate. Diffusion Dither also tends toward noisiness at 50 percent, so you may want to draw a curve that skips 50 percent.



IMAGES COURTESY OF PAUL BEYER, TANA COLOR GRAPHICS

figure 1 / **In traditional halftones** (left), the dot size varies to represent color intensity but the distance between the centers of the dots stays the same. In stochastic screening (right), on the other hand, the dot size stays the same but the distance between the centers of the dots changes to represent color intensities.

recently have PostScript imagesetters and the raster-image processors (RIPs) that contain the screening algorithms offered the extreme precision and rapid calculations necessary to make it possible.

In the past, PostScript-based color separations attempted to mimic those produced traditionally (that is, through camera work or with proprietary high-end electronic color systems). But moirés — the telltale doily pattern caused by the angled alignment of the four process-color plates (cyan, magenta, yellow, and black), which shatters the illusion of continuous-tone images by revealing their underlying dot structure — proved embarrassingly difficult to avoid. In recent years, imagesetter manufacturers have focused most of their efforts and resources on eliminating obvious moirés, or interference patterns.

But why were digital devices imitating this cumbersome conventional process, anyway? Desktop printers have been producing high-quality color output for years, using a technique called *dithering*. Dithering takes several forms, but on most color printers, it's a method of placing inks down at a frequency relative to their intensity in the original. (Sound familiar?) Good dithering avoids any obvious distribution patterns, such as moirés. In essence, the goal of stochastic screening is to move dithering to four layers on printing presses (see the "Highfalutin Dithering" sidebar). The possible results include not only sharper detail at lower resolutions but also a whole new set of color combinations that give depth and richness to printed materials.

The Stochastic Era

Stochastic screening is just emerging from the experimental stage. Only now are some print shops — generally those with in-house prepress departments that enable them to control the process from start to finish — able to sell this technology to their customers as a value-added option. Volume-oriented service bureaus that deal in quick turnaround generally are not offering stochastic output — yet.

PostScript-imagesetter and RIP vendors are exploring stochastic-screening strategies (see the "Directory" sidebar). Agfa has been in the lead, with its CristalRaster technology, which shipped just before Linotype-Hell's Diamond Screening did. Scitex offers four Class Screening options. Even Adobe Systems has entered the fray, with Brilliant Screens, which it licenses to vendors who use Adobe's RIP technology. More than 100 sites are experimenting with stochastic screening, some quite successfully. No one is giving up traditional screening yet (it's still better understood and more predictable, and hence safer). Rather, stochastic screening is offered as a bonus for clients who may benefit from and can pay for the extra effort.

There are several potential advantages to stochastic screening, including:

Better Detail. Because of its fine dot size, stochastic screening excels at revealing details that would be lost in traditional screening. As a result, it's possible to scan images at lower resolutions yet retain the appearance of higher resolutions when the image is printed.

Smoother Blends. Capably handled, stochastic screening allows for longer and subtler vignettes (color ramps) in PostScript, since it can smooth out problems such as banding and other screening artifacts that are inherent in conventional halftones.

Minimal Moirés. To some extent, moiré patterns are inevitable in traditional halftones based on rotated screens. Even if the screen angles are exact and the colors are too strong (purple, green, and other strong colors are prone to moirés), images with patterns such as tweed can create moirés. Stochastic screening eliminates moiré because there is no grid to cause interference.

Better Registration. It's not that stochastic plates magically remain in register, but because stochastic screening is freed from the



figure 2 / **Fine-art photography,** such as this book of Edward S. Curtis photographs, greatly benefits from the wide tonal range possible with stochastic screening. *Native Nations* is from Callaway Editions, which used Agfa's CristalRaster technology to produce the book.

geometric grid of traditional halftones, registration problems aren't readily apparent.

Richer Colors. Another interesting use of stochastic screening is in high-fidelity (HiFi) color, in which five or more inks are used as process colors. Adding more inks gives printed pieces a sense of depth and color range far beyond that possible with a conventional four-color process, but with traditional halftone screening, HiFi color would result in terrific moiré problems. Stochastic screening allows for all kinds of new color models without the danger of interference patterns. Many HiFi color schemes are now in development, most based on the availability of stochastic screening.

As with any new technology, especially one that impinges on the conservative printing industry, problems do arise with stochastic screening. Some faults are being corrected in software, whereas others require changes in methods and mind-set. Here are some common complaints:

Graininess. The biggest complaint so far about materials printed with stochastic methods is that they are grainy, especially in highlight areas, where very little ink is laid down, or in areas of solid color, where the same dot-distribution patterns tend to be repeated. Resolving this shortcoming requires new algorithms that treat potential problem areas specially. Some vendors offer one implementation with small dots (say, 14 microns each) and another with large dots (say, 50 microns each). Using a different dot size or experimenting with a combination of FM and AM screening may also help eliminate graininess.

Dot Gain. Early users quickly learned that compared to traditional printing, stochastic images have twice the *dot gain* — the tendency for midtone areas to darken as a result of ink spreading on the plate or into the paper. Rebuilding dot-gain curves and making new printer characterizations at the software end are two approaches that may help compensate for this.

Extra Ink. Stochastic screens lay down more ink than traditional halftones, yielding richer colors but requiring excellent press handling and fast-drying inks so that the extra ink does not spread or cause ghost images and other artifacts. Some older presses especially have trouble in this area.

Plate Problems. In stochastic screening, each tiny laser spot is important, so the existence of any dust on the plate or film can cause more noticeable defects than with conventional screening. Stochastic sites must commit to improved platemaking.

Proofing. Pages produced with stochastic screening are hard to proof. Color proofs such as Matchprints and Cromalins don't always reveal the graininess that can pop up. Because stochastic proofs lack traditional halftone dots, even professional eyes have to be trained again how to read proofs, and the tiny stochastic dots are very hard to capture on many electronic proofing devices. These factors make proofing a newly difficult problem — one that several companies are rushing to solve.

Stochastic Scheming

If you're a designer or a publisher, should you make use of stochastic screening now? Yes, if you print tricky or treacherous images and if the price is right. Fine-art photography and merchandise catalogs with particularly sharp images can use the extra "pop" and detail stochastic screening provides. If you have any hesitation, though, there's no harm in waiting until the last bugs are worked out and until printers and prepress houses are more accustomed to using the required equipment and methods.

Will using stochastic screening affect your production routine? In most cases, no, except that you must allow the prepress house to specify other screening details for your images. Otherwise, everything you do in software should be exactly the same. But to maximize your results, you may want to upgrade your photography and scanning to capture a wider tonal range. Stochastic screening seems best at improving excellent photography (see figure 2).

In any case, we recommend a calm, methodical approach to this new screening model. There is no doubt that stochastic screening will play a significant role in the prepress industry. At the same time, it's by no means certain that halftone screening will fall by the wayside. For most designers and publishers, a variety of good choices will soon be available, and getting that extra bit of quality should cost little more than getting perfectly good results.

Steve Hannaford is editor and publisher of *Prepress Business Observer*. His CompuServe address is 71131,1564.

DIRECTORY

THE FOLLOWING are some of the stochastic-screening technologies being developed by prepress vendors for inclusion in their products.

Accutone
R. R. Donnelley & Sons
Chicago, IL
312-326-8000
708-810-5323

Brilliant Screens
Adobe Systems
Mountain View, CA
415-961-4400
415-962-2659 (fax)

Class Screening
Scitex America
Bedford, MA
617-275-5150
617-275-3430 (fax)

CristalRaster
Agfa, a Division of Miles
Ridgefield Park, NJ
201-440-2500
201-342-4742 (fax)

Diamond Screening
Linotype-Hell
Hauppauge, NY
800-633-1900
516-434-2000
516-434-2706 (fax)

ESCOR-FM
Prepress Solutions
(formerly Tegra-Varityper)
East Hanover, NJ
201-887-8000
201-884-6210 (fax)

Harlequin Dispersed Screening
Harlequin
Cambridge, MA
617-252-0052
617-252-6505 (fax)

Hyphen FM Screening
Hyphen
Wilmington, MA
508-988-0880
508-988-0879 (fax)

Randot Screening
Screen (USA)
Rolling Meadows, IL
708-870-7400
708-870-0149 (fax)

Push-Button Design

Three-dimensional buttons make flat designs pop. Here's how to use your PostScript illustration package to make 3-D buttons for your next project. BY JANET ASHFORD

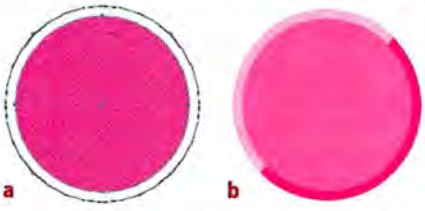
THESE DAYS, designers are often called on to create on-screen visuals for games, interactive books, and other multimedia projects. An integral part of these projects is navigational buttons that users click on to move from one screen to another. Buttons are easier to recognize (and more fun to "push") if they look three-dimensional, with color shading and shadow to imitate the buttons on a tape player, for example. Such raised buttons can also add relief to your two-dimensional designs.

Although you can make three-dimensional buttons in a paint program, it's easiest to draw them in Aldus FreeHand, Adobe Illustrator, or any other PostScript illustration program that offers blends, gradations, and other effects for duplicating the shadows and highlights that make flat surfaces pop. For on-screen art, you can open PostScript files in Photoshop and convert them to bit maps.

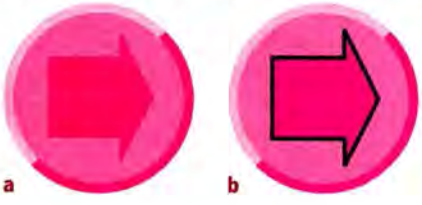
Janet Ashford is coauthor of *Aldus PageMaker: A Visual Guide for the Mac*, published by Addison-Wesley this summer.

I A Simple, Flat Button

1. Making Circles. In Adobe Illustrator, draw a circle, make a copy of it, reduce the copy to 90 percent, and fill the copy with a shade of red. Rotate the outer circle by 45 degrees so that its anchor points fall on a diagonal to the inner circle's vertical axis (a). Using Illustrator's scissors tool, cut the outer circle at two points to split it in half. Fill the upper half with a lighter shade of red and the bottom half with a medium-dark shade of red. The variation in color along a diagonal axis makes it look as if light is falling across the circle from upper left to lower right (b).



2. Adding an Arrow Symbol. Type in a directional arrow from Zapf Dingbats, convert the font to outlines, and then scale the arrow horizontally by 50 percent or until it fits nicely inside the button. Fill the arrow with a medium-dark shade of red (a). To add highlight and shadow to the arrow, paste a copy of the arrow in front of the original and give it a fill of None and a thick, black stroke. Use the scissors tool to cut the black outline at its topmost point and at its lower left corner to create two separate paths. Give the paths rounded end caps (b).

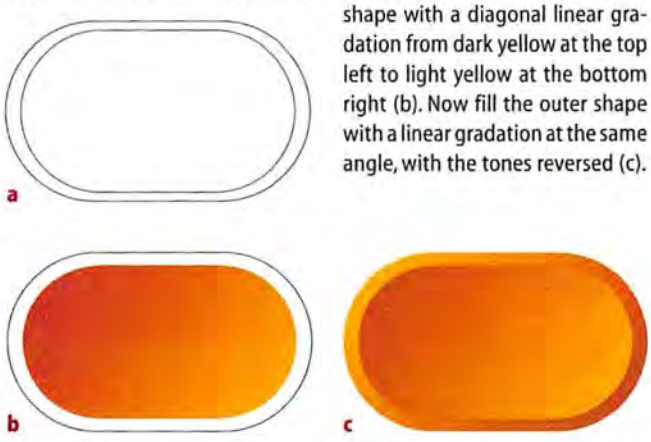


3. Changing the Contour Colors. Change the color of the upper segment of the arrow outline from black to light red and the lower segment to dark red. The arrow now looks raised, and the rounded end caps approximate the look of a beveled corner. For more contour-color ideas, take a look at the real buttons and knobs around you. Note their construction and how light plays across them to make them stand out from their backgrounds.



II A Concave, Oblong Button

1. Making and Filling the Shape. To create an oblong button in Aldus FreeHand, draw a circle, cut it in half, pull the two halves apart, and then join the halves with two horizontal lines. Copy the oblong and reduce the copy to 90 percent (a). Now move the points at the top and bottom edges of each oblong toward the center until the gap between the inner and outer shapes is uniform. To make the button appear convex, fill the inner shape with a diagonal linear gradation from dark yellow at the top left to light yellow at the bottom right (b). Now fill the outer shape with a linear gradation at the same angle, with the tones reversed (c).



2. Adding Text. After typing a label (the font here is Helvetica Black), convert the type to paths and scale it to fit inside the button. Fill the type outlines with a dark shade of yellow. Copy the outlines, fill the copy with a light shade of yellow, and offset the copy a few points up and to the left (a). Use the Send Backward command to move the light copy behind the original, to create the look of raised type with a highlighted edge (b).

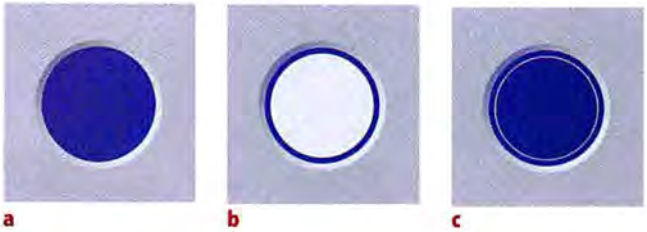


III A Realistic, Round Inset Button

1. Starting the Button. To create a round button that looks as if it's depressed into a metal surface, draw a circle in Aldus FreeHand over a background filled with a 20-percent blue tint. Give the circle a line of None, and fill it with a logarithmic graduated fill set at a diagonal, going from 50-percent blue at the top left to 5-percent blue at the bottom right. Remember that the more steps you specify, the smoother the graduated fill will be — but it will take longer to redraw on-screen and to print.



2. Adding Circles Within Circles. By layering progressively smaller, solid-colored inner circles, you can make it look as if the button has a trimmed edge. First, clone the outer circle (unlike copying or duplicating, cloning positions the second circle exactly on top of the first), tint the clone 90-percent blue, and scale it 90 percent from the center (a). Then clone *this* circle, tint it 5-percent blue, and scale it 90 percent from the center (b). Now clone this last, light-blue circle; tint it 90-percent blue; and scale it 90 percent from the center (c).



a b c

3. Blending the Inner Circle. To add a highlight to the button, make an ellipse by cloning the innermost circle and scaling the clone to 50 percent horizontal and 20 percent vertical. Fill the ellipse with 10-percent blue, and position it at the top of the dark-blue inner circle (a). Blend the ellipse and the circle (b), and rotate the blended object 45 degrees (c).



a b c

4. Adding Embossed Letters. To make letters appear to rise above the surface, type the text (the font here is Lubalin Graph), convert it to paths, and fill it with the same 20-percent blue of the background. Make two copies, filling one with 5-percent blue and the other with 50-percent blue. Position the light copy behind the original, slightly above and to its left, and place the dark copy behind both of these layers, slightly below the original and to its right.

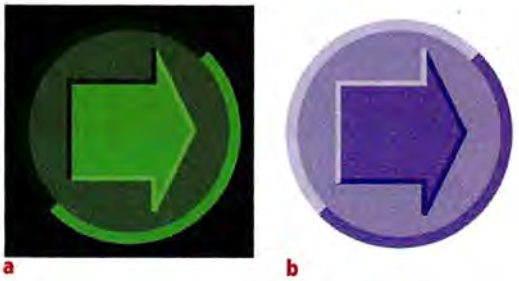


IV Bit-Mapped Buttons

1. Converting EPS to a Bit Map. If you want to use a button on-screen, note that Adobe Illustrator art can be opened or placed in Adobe Photoshop, which turns the PostScript shapes into a bit-mapped image. When you open or place an EPS file, you'll be prompted by the EPS Rasterizer dialog box to pick a resolution for the bit-mapped result. The resolution of most computer screens is 72 dpi, so use that as the value. (FreeHand files sometimes don't open in Photoshop; you may have to use a utility such as Altsys' EPS Exchange, to convert your FreeHand file into an Illustrator file first.)



2. Creating Color Variations. In on-screen presentations, buttons often change color when they are "pushed." Use Photoshop's Invert command (under Map, on the Image menu) to make a version with colors exactly opposite those of the original (a). Another way to change the color of the original button is to use the Hue/Saturation command (under Adjust, on the Image menu). By decreasing the hue levels, we turned our original red image purple (b). Still another method is to make your original buttons gray scale (c). You can then open them in RGB mode in Photoshop. To add color to a gray-scale image, click on Colorize in the Hue/Saturation dialog box and then adjust the position of the hue slider until you get the color you want. Here, we also changed the contrast to make a dramatically lit, gold-toned button (d).

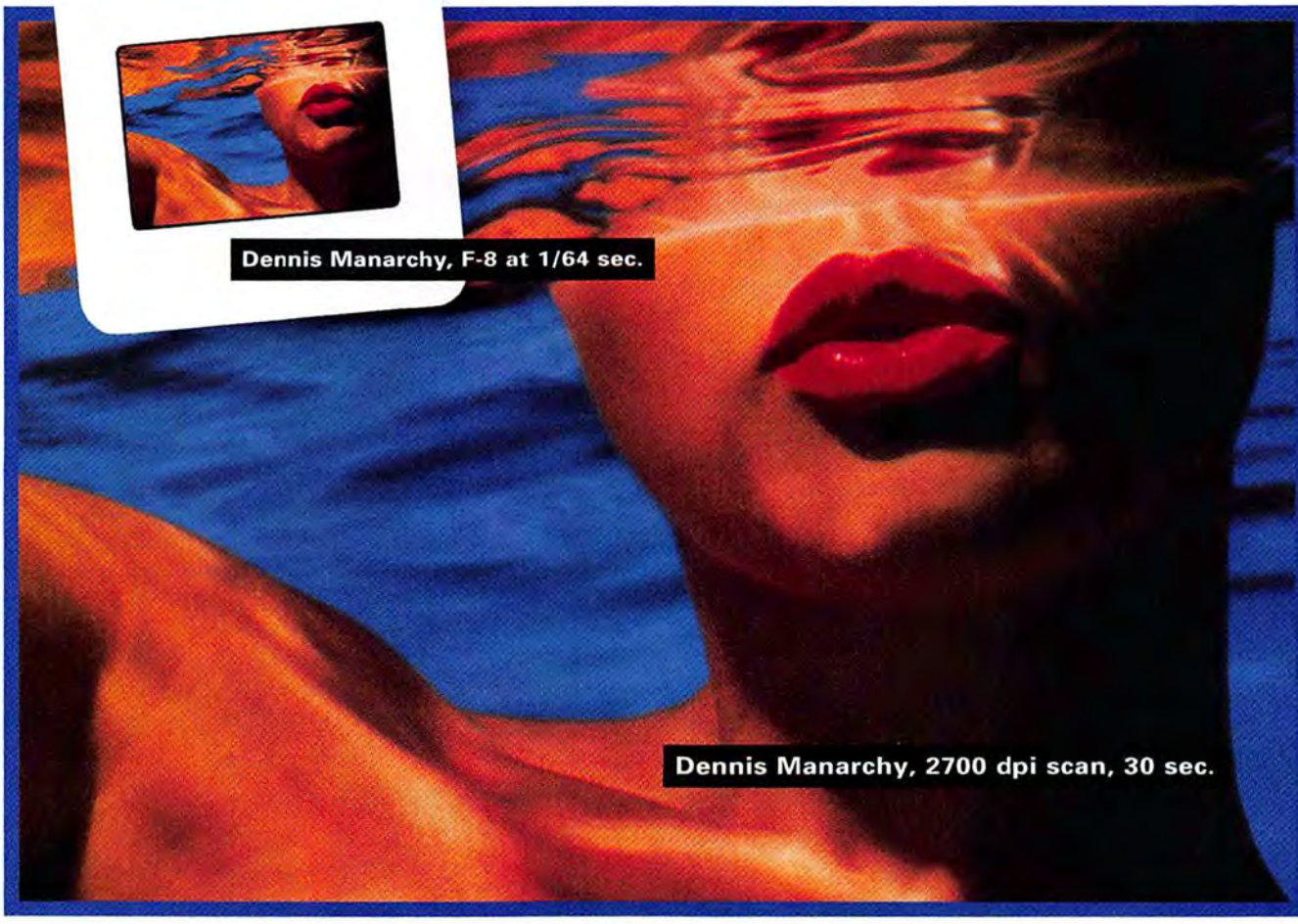


a b



c d

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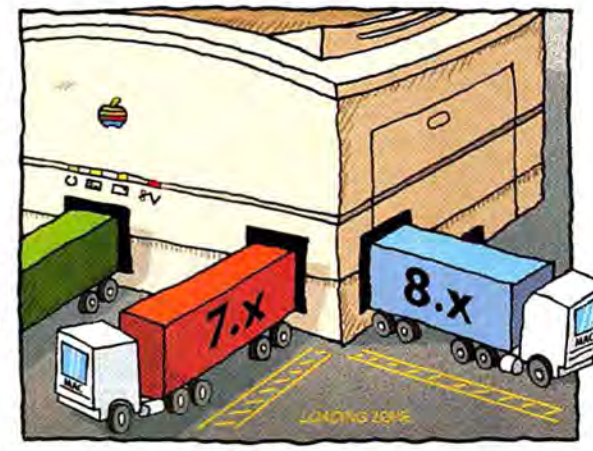
SprintScan 35 scans slides at 2700 dpi in under a minute.

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* Source: Evaluations by Rich and Associates, June 1994. † Suggested list price. Actual purchase price may vary. "Polaroid" and "SprintScan" are trademarks of Polaroid Corporation.

Driven to Distraction

Which LaserWriter driver should you use? The latest isn't always the best. Here's the inside scoop on printer drivers. BY BOB SCHAFFEL AND CHUCK WEGER



YOU MAY NOT think too much about printer drivers, but selecting the right one can make a difference in how quickly your files print. A few options are available; which one should you choose?

There are currently two PostScript printer drivers: the old Apple standby LaserWriter 7.x and the newer LaserWriter 8.x (also available from Adobe as PSPrinter 8.x). As of this writing, the latest version is 8.1.1. Each driver has its advantages.

LaserWriter 7.x is a direct descendant of the original (circa 1985) version. As new functionality was required over the years, new code was appended to the existing driver. As a result, the PostScript it generated was sometimes less than optimum. Adobe rewrote the driver to streamline PostScript operations and make it PostScript Level 2-aware. For people dealing with images that have been compressed with JPEG compression, using the 8.x driver is a big plus: JPEG files are passed through the 8.x driver directly to Level 2 printers.

A key difference between the two versions is that version 8.x uses a universal file type called a PPD (PostScript Printer Description), which tells the driver what features, such as extra trays, special paper sizes, and so on, are available on the printer or imagesetter. The 8.x driver reflects these features in the Page Setup and Print dialog boxes. In contrast, under the 7.x driver, each application has its own (usually unique) way of specifying printer features.

You can update the 8.x driver's awareness of output-device characteristics for your own machine. Clicking on the Setup button and then the Printer Info button in the Chooser queries the printer and stores the answers within the driver itself, so it can optimize the PostScript it sends to the device. After the update, an icon indicating the type of output device appears in front of the printer's name in the Chooser.

This customization and optimization of the 8.x driver generates PostScript that helps the output device print faster than with the older driver. Because of some additional convenience features, such as letting you print several pages up and allowing you to create an EPS file of any page when saving PostScript to disk, the 8.x driver is a real improvement — but not necessarily for high-end output.

Here's why: LaserWriter 8.x uses a two-pass architecture. While it's querying the printer, the application's print file is being spooled to the hard disk so that it can be examined for resources (fonts and the like). The spooling happens in the foreground, even if you have background printing turned on in the Chooser. For long documents, spooling can take quite some time. Worse, if your document contains high-resolution images, you need as much disk space for the spooling as for the images themselves. No disk space, no output — end of story!

There is a workaround, however, if you have a server with oodles of capacity. On the server, select the same output device and enable background printing. With AppleShare, share the server's System Folder and mount it on your Mac. Make an alias of the server's PrintMonitor Documents folder (it's in the System Folder), and move it to your Mac's System Folder (replacing the one already there). This should enable you to spool to the server's hard disk.

Some applications create their own PostScript and use the LaserWriter driver only for Mac-to-printer communication. QuarkXPress, for example, uses its own PostScript driver and PDF (Printer Description File). PageMaker 5.0, on the other hand, requires the LaserWriter 8.x driver and current PPDs to print properly.

Whenever you change from one driver to another, heed the Chooser warning to select the Page Setup dialog box for all currently opened documents. It's the only way most applications can reestablish a link between the LaserWriter driver and themselves.

With LaserWriter 8.x, it's generally safer to select the same PPD in the Chooser and in the application. If you're using Adobe Separator with the 8.x driver, the latter will automatically use the PPDs in the Extensions folder; you don't need the PPD folder in the Separator folder. Aldus FreeHand 4.0 saves the PPD with the file, but this is overridden at print time by the PPD selected in the Chooser. A workaround for this is described in FreeHand's Read Me file, section 6.

The current PostScript printer drivers create the same output code whether you print directly or use background printing. However, LaserWriter 8.x's spooling as part of the two-pass architecture means you will, in effect, be spooling twice — once for QuickDraw and again for PostScript. It is mostly for this reason that we recommend that you stick to LaserWriter 7.x for high-resolution output (unless your favorite aunt has bequeathed you a 4-GB drive from her Mac system).

Bob Schaffel is technology director of the Professional Prepress Alliance, a trade organization of pioneering service providers. Chuck Weger is an independent consultant and publisher of the *Photoshop Monitor* newsletter.

There is nothing like the feeling of losing your data. There is nothing like booting up to find that your twenty-page conference report has burned to a crisp. Or watching a month's worth of virus-infected spreadsheets go up in smoke right before your eyes.

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NEW NORTON AND FIRES EVEN BEFORE YOU



The new versions of Norton Utilities and SAM provide proactive protection. Kind of like little firemen running around behind the scenes stamping out fires before they can ever start. So, even if it could've been a ten alarmer, you'll never hear a thing.

The enhanced Filesaver feature proactively and consistently works to maintain your system at premium health by scanning in the background for early signs of trouble. This new agent-oriented technology is a Norton exclusive that personally reminds you when it's time to do basic data maintenance such as backing up or optimizing. In terms you can easily understand. It also automatically monitors your data for up to 500 deleted files so they can be easily recovered.

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The enhanced Speed Disk's unique customization feature lets you defragment everything from a whole volume to a selected file.

And Norton Utilities 3.0 now also includes enhanced backup. Which creates self-extracting and self-restoring backups of your data.

This improved capability makes it even easier for you to restore data during emergency situations. And our backup now also supports tape drives.



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greatest level of protection against new viruses as they are discovered.

The new SAM also scans for and destroys viruses in more types of compressed files than any other antivirus software can. SAM covers DiskDoubler, Compact Pro, StuffIt, and Now Compress. This ensures your ability to detect and eliminate a virus in any compressed file.

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What it shakes out into is that improved Norton 3.0 and SAM 4.0 now provide your Mac with the ultimate available levels of proactive protection against data loss. It's all rather amazing.

Then again, maybe all of these advancements are not so amazing. After all, Symantec is, of course, the proven industry leader when it comes to Mac data repair and recovery and virus protection.

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NEW SAM PROVIDES THE BEST PROTECTION AGAINST VIRUSES.

However, that's just the half of this proactive pair. We've also fully redesigned SAM 4.0 to provide the most complete and most effective virus protection, detection, and elimination of known and unknown viruses. So that what could turn your entire system into a towering inferno never even becomes a spark.

Accelerated for Power Macintosh

Norton and SAM are accelerated for Power Mac, letting users take full advantage of the speed capability this technology provides.

One of SAM's exclusive features is automatic virus updating. Through your modem, SAM automatically dials the Symantec BBS daily, weekly, or according to any schedule you tell it to follow.

It then downloads the latest virus antidotes and updates your virus definition files. So you now no longer have to mess with manual updating. This assures you have the improved SAM is also the faster SAM. The 4.0 version scans for viruses significantly faster than its predecessor. Which makes virus protection more seamless and less disruptive to your work flow.

Want more? Okay, SAM is also the only virus protection software that allows you to create a custom decontamination disk specific to your machine. This lets you reboot your Mac easily should your system crash from a virus.

The 4.0 version also simplifies the user interface by combining SAM Intercept and Virus Clinic into one easy-to-use component. This advancement allows you to configure more expert options from one convenient location.

POWER MAC NATIVE.

While these new versions will protect your original Mac, they are also Power Mac native. So those of you with a Power Macintosh can take full advantage of the increased processing power. Ultimately, that

So, pick up the entirely new versions of Norton Utilities and SAM. And then, if you smell something burning at the office, you'll know it's either yesterday's coffee or that guy two cubes upwind who's trying to put out his fiery data disaster. That you well know could have been prevented in the first place.

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To keep data loss from casting a glow on the office landscape, call 1-800-628-4777, ext. 9GGG. If you own Norton Utilities and SAM, you can order upgrades for $39.95 and $29.95 respectively.* Or you can purchase the new versions at your software store.



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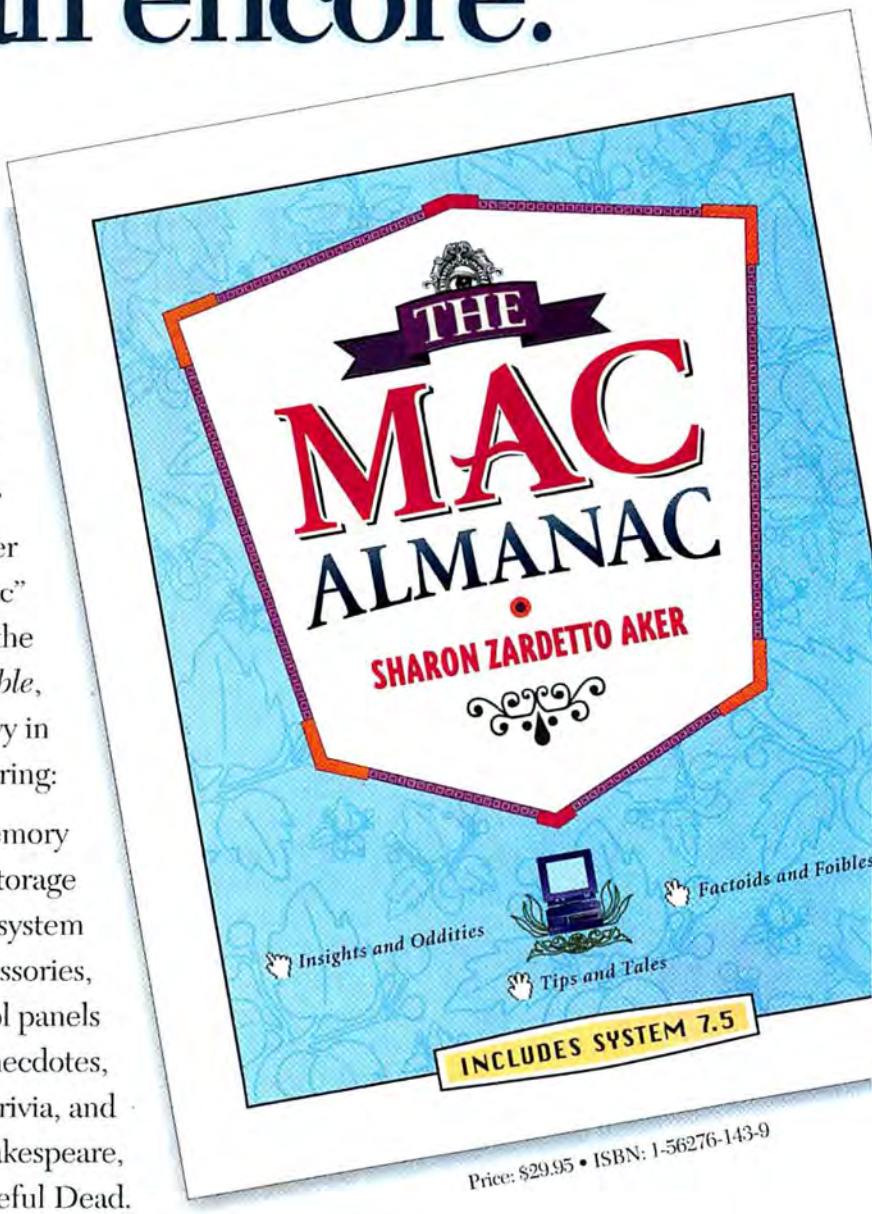
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COMMUNICATIONS /

AFFORDABLE VIRTUAL COMMUNITIES FOR K – 12



ILLUSTRATION / JACK MORTENSBAK

HELP FOR STUDENTS, teachers, and parents who want to communicate better is here. Apple's new Education Series debuts with the Communications Bundle, which comprises a 68x00-based Workgroup Server (WS) and SoftArc's FirstClass mail and conferencing software to help students collaborate on projects at home or in school. The Communications Bundle is sold in two parts: a server ($2,599 for a WS 60, $6,389 for a WS 80) and a software license ($895 for 100 users, $1,495 for 250 users). Also in the Education Series, the AppleSearch Bundle for the Internet (approximately $11,000) includes a WS 95; A/UX; and AppleSearch, which provides a front end to Internet wide-area information servers. Prices for both bundles include on-site help with installation and setup.

Homework Hotline ($499), from High Tide Software (800-878-8433 or 510-704-9927), contains voice-mail software for SE-or-higher-level Macs, plus a template with prerecorded menus. Parents can leave messages for teachers or find out about cafeteria menus and other hot topics. / John Rizzo

NETWORK BACKUP /

Macs and PCs Share Servers

CROSS-PLATFORM BACKUP has come to the Mac, thanks to Cheyenne Software (800-243-9462 or 516-484-5110). Cheyenne's ARCserve for Macintosh ($245 for 5 users, $495 for 20; $295 or $895 for 15- or 20-user add-ons) is a network-backup application much like Dantz Development's Retrospect, with two notable differences: It supports backup to a tape drive anywhere on a network (as long as the ARCserve extension is installed on the Mac attached to the drive), and it provides cross-platform backup with PCs in a Novell NetWare environment (users submit backup jobs to a server running ARCserve for NetWare). ARCserve products support DAT, 8-millimeter, and QIC tape. / Shelly Brisbin



Better AppleTalk for PCs

ACCESS FILES on Windows PCs from your Mac faster and more easily with version 4.0 of Personal MACLAN Connect ($199; ten-pack, $999; upgrade, $95), a PC software package from Miramar Systems (800-862-2526 or 805-966-2432). Personal MACLAN Connect lets users of Macs with AppleTalk connections to PCs use the Chooser to log on to and mount PC directories and hard disks. Version 4.0 acts as a print server and adds two-way printing, so Mac users can use printers connected to PCs and vice versa.

Version 4.0 also improves Mac-to-PC AppleTalk connection. It uses a faster AppleTalk implementation and supports the Windows ODI standard, so that PCs can run AppleTalk and Novell NetWare concurrently over a single network interface card. The PCs can use standard LocalTalk, Ethernet, token-ring, or ArcNet cards. Support for the NDIS standard lets AppleTalk run concurrently with LAN Manager or Windows for Workgroups.

Other new features include sharing of multiple or nested PC directories and file-extension mapping, which makes files on the PCs appear as double-clickable icons on the Mac. / JR

Economical Wide-Area Routing

A SLOW WAN LINK can pile up hefty connectivity charges, but upgrading to a faster connection — such as a higher-bandwidth phone line — can be too expensive for offices that use WAN links only occasionally. So, Advanced Computer Communications (800-444-7854 or 408-366-9600) offers the Danube ($1,995), a multiprotocol router with bandwidth-optimizing software.

The Danube can transfer data at rates as fast as 2.048 Mbps over a WAN link; at slower speeds (64 Kbps or slower), it uses 4:1 compression for efficiency. ACC's included software automatically allocates WAN bandwidth to established sessions and minimizes connect time by shutting down links after an idle period.



The 10.5-x-7-x-1.8-inch Danube has 2 MB of RAM, upgradable to 8 MB, and supports such WAN protocols as RS-232 (V.42), Frame Relay, PPP, X.25, and HDLC. It also supports several routing protocols, including AppleTalk RTMP, TCP/IP and NetWare RIPs, and OSPF. / Nancy Peterson



Unveiling QuickMail 3.0. The Ultimate Delivery System.



This is how E-mail should be. Totally complete, ready to go, right out of the box. Chock full of everything you need to make the connection with virtually anyone, anywhere. And so intuitive, so highly automated, you won't have to spend half of your life with a user's manual.

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❖

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❖

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❖

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❖

Clients for Mac,® Windows™ and DOS users, all with the same look and feel.

❖

QM Forms,™ an application to create your own custom electronic forms.

❖

QM Remote,™ for sending and receiving messages anywhere.

❖

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❖

Gateways and bridges included FREE!

And even before this latest upgrade, QuickMail was also the choice of the experts. As *Macworld* proclaimed, ". . .with its combination of excellent user and administrator features, its ease of use in a mixed environment, and its improved remote access abilities, QuickMail retains its superiority in an increasingly competitive E-mail market."

If you happen to be stuck using one of those other LAN-based systems QuickMail is superior to, now you can make the switch to QuickMail and save with our special $12 per user upgrade offer.

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CARD #_____ EXP. DATE _____
CARDHOLDER SIGNATURE _____

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Beyond File Service

The global directory and messaging services of cross-platform network operating systems can help pull together the far-flung departments of your company.

BY KELLI WISETH

A NETWORK operating system (NOS) is much more than just a pricey print spooler and file-server software. In a large company internetwork — which might include Windows-, UNIX-, OS/2-, and DOS-based workstations as well as Macintoshes — a NOS can offer a foundation for easier communications among platforms. NOSs from Banyan, Novell, and Microsoft can increase Mac users' participation in an enterprisewide environment through services that provide such features as mainframe and database access, remote connectivity, and communication with the outside world. Network administrators can benefit by having only a single resource to manage for Mac and non-Mac clients.

Like network administrators, folks slogging through a daily routine typically care only about the services that make their lives easier. Directory and messaging services do just that by answering such questions as, Where's the closest color laser printer? and, Who's in charge of payroll this week? They also enable cross-platform messaging and the use of work-flow applications. Directory and messaging services, which are central to an enterprisewide network, can provide the most value to users and provide network administrators with simplified management in cross-platform environments.

Directory Assistance

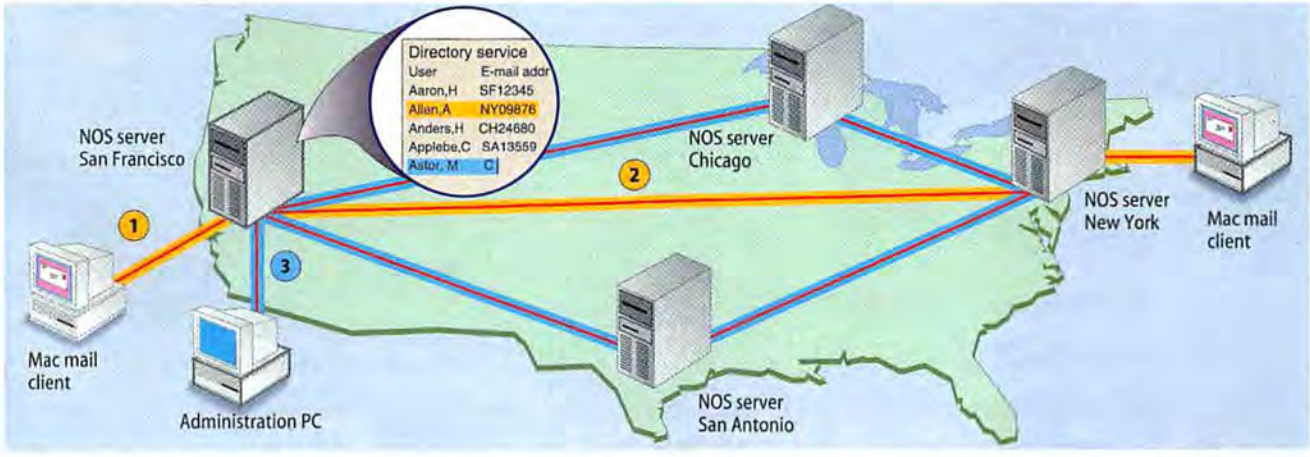
A directory service is a digital phone book that helps you locate people, equipment, and services available on the network. A small company might make do with a local directory service built in to its e-mail server. But an organization with tens, hundreds, or thousands of employees or with geographically dispersed people and equipment can benefit from a global directory service that spans an entire company with many servers.

Banyan's VINES offers the most mature directory service on the market; it's been around for ten years and is in its third generation. Every server on a VINES network has a StreetTalk service, which keeps track of all the objects — users, services, and groups — under its control. All StreetTalk servers automatically exchange update information to maintain complete databases of all StreetTalk objects, companywide. StreetTalk also maintains attributes, or extra information about each object, such as job title, location, and phone number.

Users don't access StreetTalk directly; they access the StreetTalk Directory Assistance (STDA) service, a distributed database of network objects that a workgroup or a company can sort and configure as needed. Network administrators can configure the STDA service to limit access to attributes, so, for example, a salary attribute may be available only to a company's senior executives. Because users can also search the database by attributes, they might do so to find the color printer nearest their office or the payroll-department manager.

Apple's PowerShare Collaboration Servers catalog services offer directory services

MESSAGING AND DIRECTORY SERVICES / *NOS services help far-flung users connect*



GLOBAL DIRECTORY AND MESSAGING services can provide convenient features for users and administrators connected to servers across a building or across the country. The mail client software accesses the global directory service to find other users' electronic addresses (1). The messaging service sends the e-mail across the WAN (2). Adding a new user to one server adds the name to the other servers around the enterprise (3).

in an all-Mac environment. However, unlike with VINES' directory service, which forms the foundation of the NOS and is designed for wide-area networking, you add on Apple's directory service after you've set up your network.

Say that ten accountants in your company need access to three AppleShare file servers. The administrator adds their names and passwords to the user lists of all three servers, for a total of 30 entries. To make the accountants part of an enterprisewide directory, the administrator must add them to the PowerShare catalog server's user list. In a VINES environment, the accountants are added just once. Access rights to all servers are configured in the users' profiles, which are created at the same time as the user IDs. The StreetTalk database automatically broadcasts this information to all StreetTalk servers; the STDA service consolidates the information into the global directory. The ten accountants and the unhappy details of their numerical lives will be searchable by the rest of the company with the ease of a few mouse clicks from either Macs or PCs.

With NetWare 4.0 and the introduction of its NetWare Directory Service (NDS), Novell throws its hat into the global-directory-services ring. Like Banyan's StreetTalk, NDS keeps track of all network resources. Mac users won't have access to NDS until the end of the year, with NetWare 4.1. However, Novell has far-reaching plans for making the Mac an equal player in the NetWare environment by including native-IPX (instead of AppleTalk) client software for all Macs and by porting NetWare to Apple's PowerPC Workgroup Servers. The last phase of Novell's master plan is to have IPX-based Mac client software using NetWare Core Protocols (NCP). When all this happens (it's scheduled for completion by early 1995), a Mac on a NetWare network will be able to do anything a DOS or Windows workstation can, including access databases, perform administration, and manage networks.

Microsoft Windows NT Advanced Server doesn't include a global directory service. It organizes user-account information by domain, a collection of computers that are grouped and that share a common security database. Mac users, however, aren't privy to this information, nor would it help them find resources on the network the way a directory service with attributes does.

Messaging Services

A messaging service routes e-mail and other messages through a network to their destination by using a store-and-forward mechanism, typically called a transport agent. Later this year, Microsoft will release a messaging service called Enterprise Messaging Server (EMS), which will run on top of Windows NT Advanced Server. EMS will be able to import LAN Manager user names, NetWare 3.x binderies (lists of user information), and basic NDS information for use by the messaging system. But without an integrated directory service, EMS (or any messaging service) must have its own directory, or address book, for addressing and routing messages — more work for administrators.

When your directory and messaging services are closely linked, as they are in Apple's PowerShare and Banyan's VINES, administration is easier. For example, a

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CIRCLE 122 ON READER SERVICE CARD

user's mailbox is created at the same time as the user is added to the PowerShare catalog and to StreetTalk. Mac users access the PowerShare catalog or the StreetTalk directory to address their e-mail messages.

When directory and messaging services aren't closely linked, network administration is more cumbersome. For example, Novell's MHS (Message Handling System) has its own directory mechanism, which must be administered apart from other file-server user lists in NetWare 3.x. NetWare 4.0, however, brings the directory-service benefits — and the administrative overhead — of NDS. In an all-4.0 environment, the messaging service uses NDS to manage updates to the directory. But in a mixed environment (NetWare 3.x and 4.x), both directories require administration. Mac users can access Global MHS (the latest version of MHS) directly from a variety of client applications, including Lotus' cc:Mail and CE Software's QuickMail, without gateways.

Banyan offers VINES Mail client software that directly accesses Banyan's Intelligent Messaging engine. Users can send and receive mail throughout an enterprise, and users who alternate between a PC and a Mac have mail access from either platform. Banyan's acquisition of Beyond, with rules-based BeyondMail client software, should bring cross-platform work-flow ability to Mac users. Beyond's client packages support Global MHS and VINES messaging.

Who Needs a NOS?

If you've got a small, all-Mac network, you have little reason to move to one of these NOSs: The benefits of Banyan's, Novell's, or Microsoft's products won't outweigh the costs of administering, supporting, and maintaining multiple platforms. Any services you might need — remote-access service, gateways to mainframes, database access, communications services — can be added on to an all-Mac network through products from Apple or third parties. If your company is growing and people are having difficulty keeping track of servers, printers, and each other, you can install an Apple PowerShare catalog for directory services.

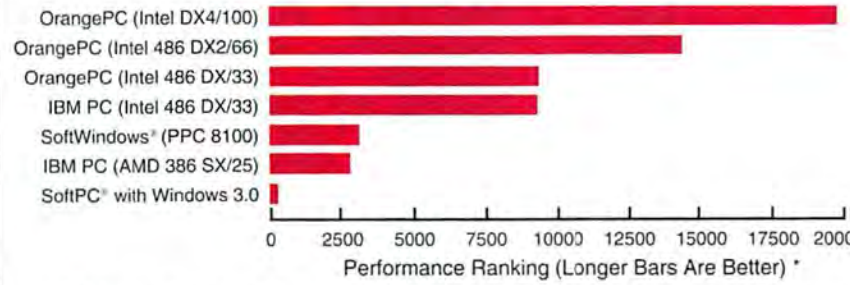
But for any growing organization that has more than just Mac users, a NOS offers advantages. For building geographically dispersed, wide-area networks that have Mac and PC clients, VINES offers the most robust directory service on the market today.

NetWare is the market leader in LAN connectivity, enabling cross-platform access to Mac, PC, and UNIX users. Although NetWare 4.x doesn't provide directory services for Mac users, Novell's Mac client-software efforts — native-IPX Mac client software, NetWare on Power Macs, and NCP Mac client software — will erase any distinction among platforms in an enterprise.

Microsoft's Windows NT Advanced Server has potential, but because it lacks integrated directory and messaging services at this time, it's not as strong a contender for large, cross-platform networks.

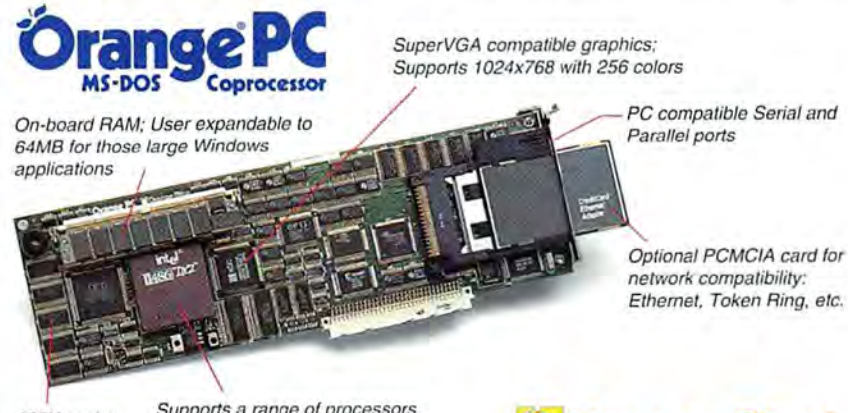
Kelli Wiseth heads NetResults, a network-consulting firm in the San Francisco Bay Area.

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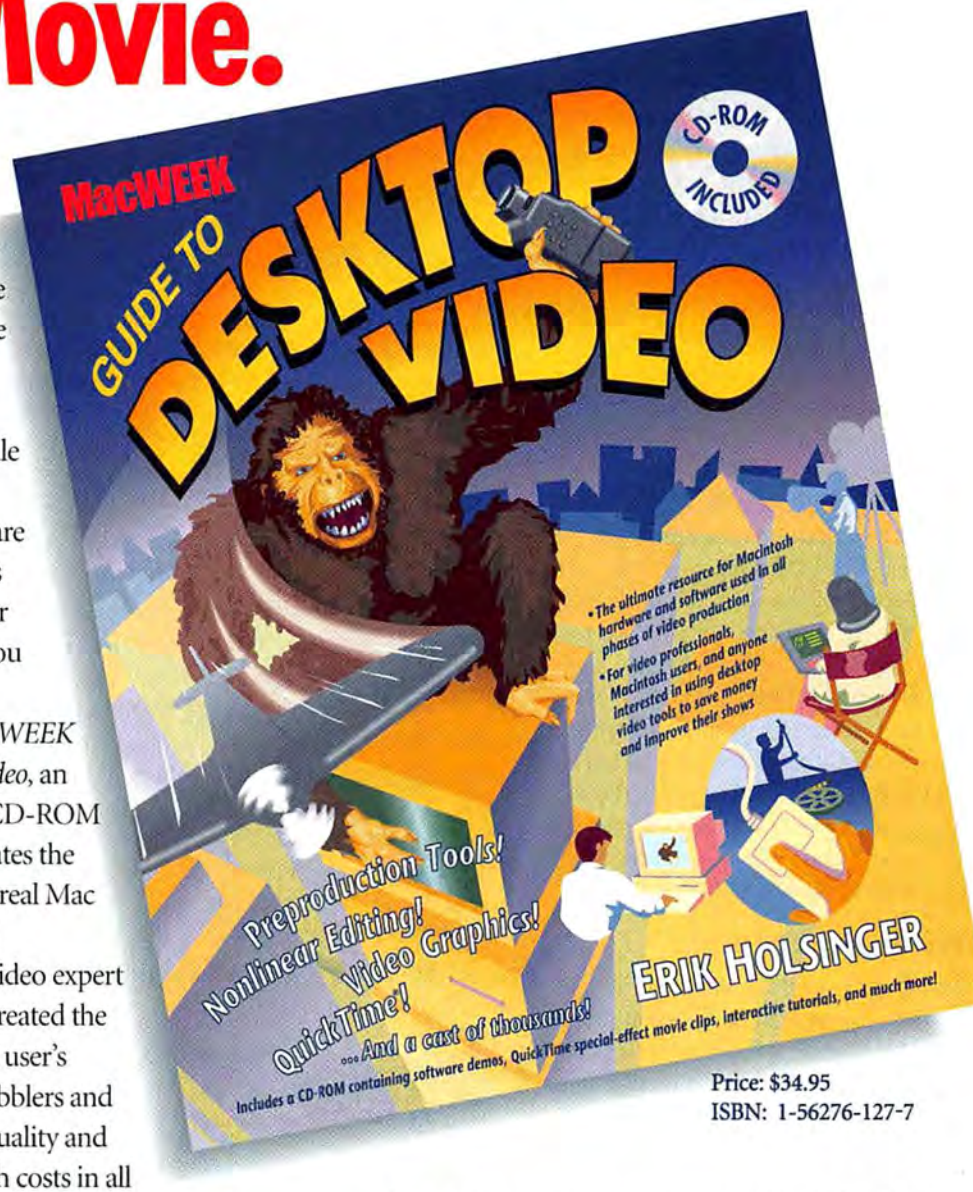


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System Software, '90s-Style



Next year's operating systems will offer true cross-platform compatibility and a brand-new style of computing — with Taligent's leading the way. BY JOHN RIZZO

THE 1990s BEGIN next year. At least as far as computing goes. Right now we're still stuck in '80s-style computing, with increasingly complex graphical interfaces and limited cross-platform networking and compatibility. Starting next year, you'll be able to choose among several new operating systems that go beyond the tired old file-and-folder metaphor and begin to tear down the walls between hardware platforms.

The successor to System 7, code-named Copland (expected next year), will lead the way to a radical advance in the Mac's user interface and software architecture that will culminate in Gershwin (also a code name), Apple's standard Mac OS beginning in 1996. Next year will also see the introduction of PowerOpen, the Apple/IBM version of UNIX, as well as a new operating system/user environment from Taligent, the Apple/IBM/Hewlett-Packard joint venture that grew out of Apple's Pink project. PowerOpen and Taligent's software represent a new breed of operating system that can run on Macs as well as other computers.

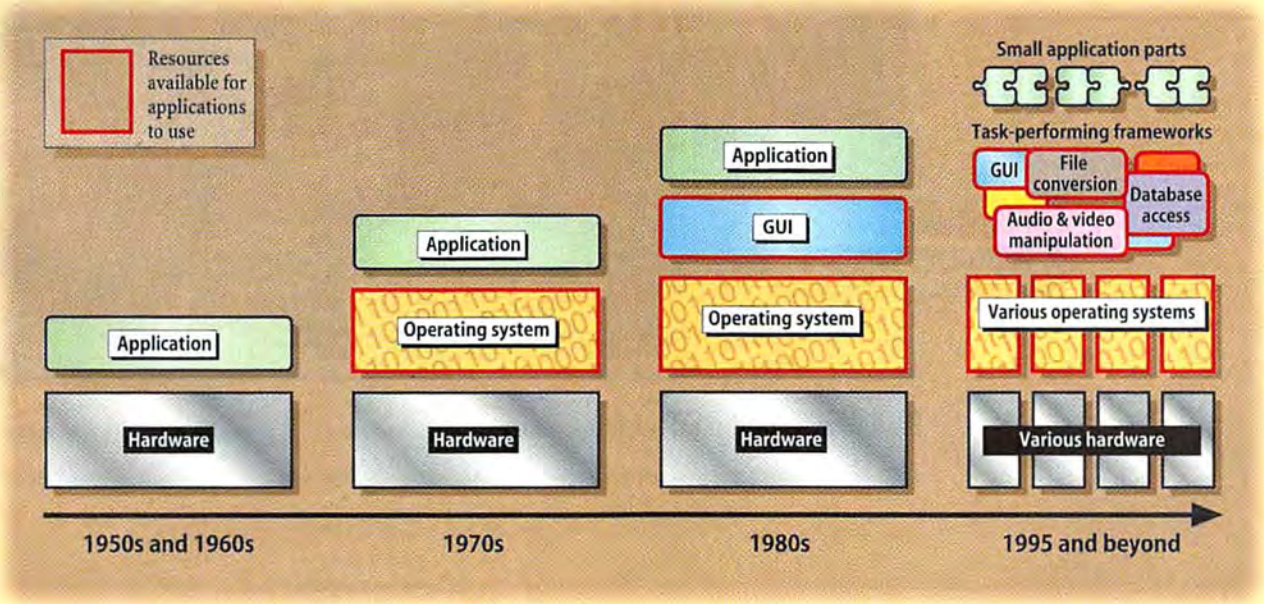
Apple has been keeping details on the Copland and Gershwin projects under wraps, and PowerOpen will look basically like UNIX. But Taligent, which has been showing its technology since earlier in the year, recently seeded developers with development code. The question now is the same one asked about the Mac when it was first introduced — will it fly?

A Multiplatform Platform

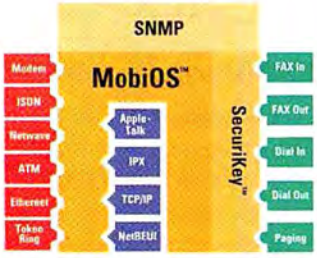
Copland and Gershwin will be the operating systems for average users. PowerOpen and Taligent's software, on the other hand, offer a network focus, with client/server capabilities such as those provided by UNIX and Microsoft's Windows NT. These capabilities are well suited to creating enterprisewide,

THE EVOLUTION OF COMPUTING / *modular, platform-independent software arrives*

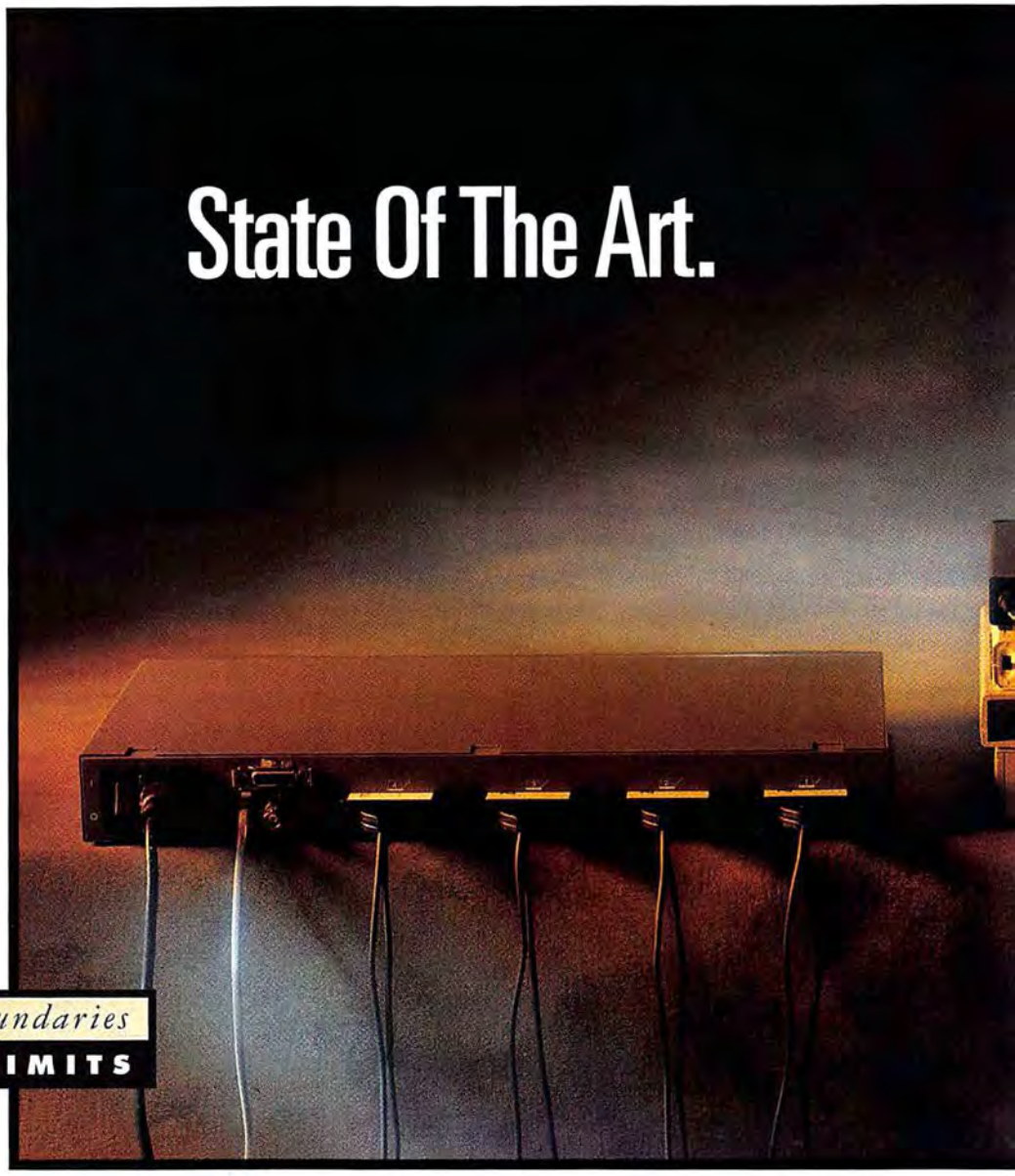
THE MODULAR STRUCTURE of Taligent's software — and to some degree that of Copland and Gershwin — represents the next evolutionary step in the history of computing. In the '50s and '60s, every piece of software controlled a specific type of hardware directly, making it difficult to rewrite software for new hardware. The operating systems of the '70s helped by controlling the hardware, rather than forcing independent applications to control it. Then, when graphical user interfaces (GUIs) were introduced in the '80s, application developers no longer had to create their own interfaces from scratch. Now, Taligent's software goes a step further by building powerful, task-performing frameworks into a platform-independent interface — so developers can easily create small, portable custom applications. Breaking applications up into functional parts is also a trend in the Mac operating system, as the release of OpenDoc next year will demonstrate.



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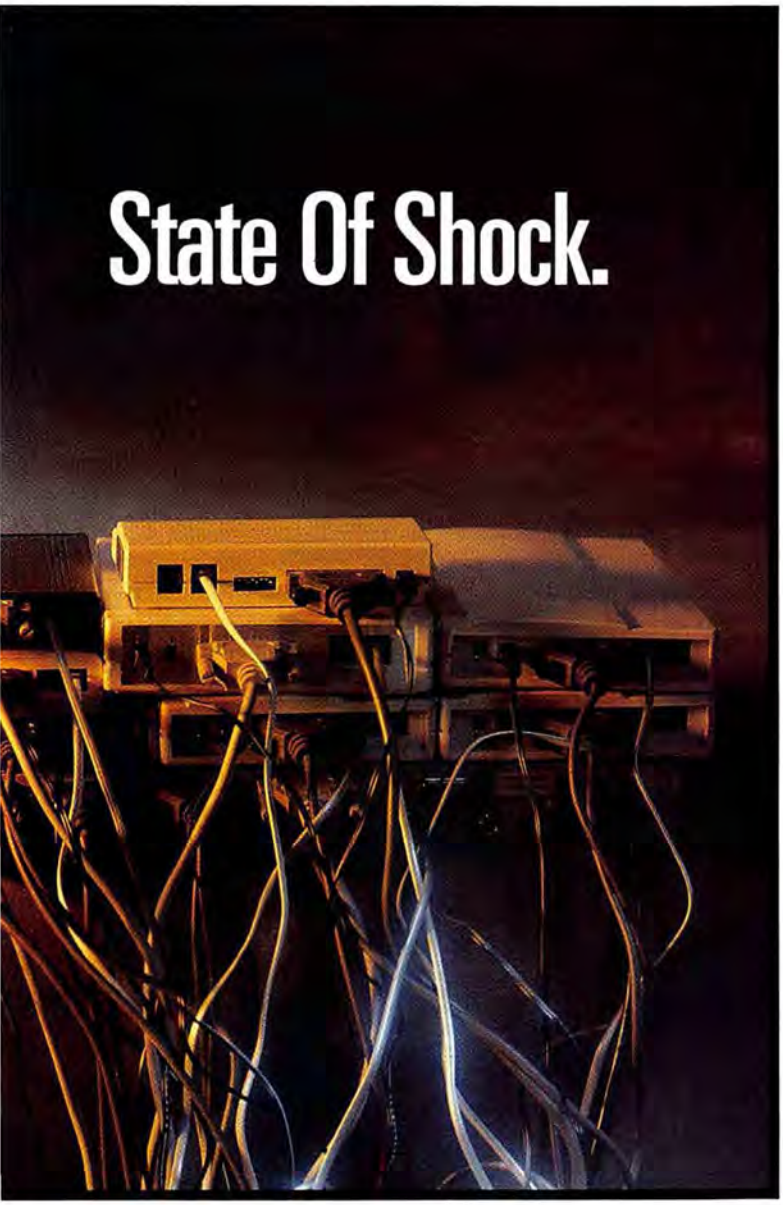
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custom applications such as order-entry systems — applications for which UNIX is the predominant OS today. Taligent, for one, hopes to make inroads into both the custom-applications market and mainstream corporate computing. To serve enterprise users, Taligent's software and PowerOpen require the same rather beefy computer resources — a fast CPU with lots of hard-disk space and RAM — as NT currently does.

The success of these new operating systems will be judged according to the amount of software written for them. Copland and Gershwin will be able to run today's Mac applications in addition to new Copland/Gershwin-savvy applications — whatever that turns out to mean. PowerOpen will be able to run hundreds of existing AIX (IBM's popular version of UNIX) applications as well as Mac applications.

Taligent would seem to be at a disadvantage, since Taligent-savvy applications don't exist yet and Mac or Windows software won't run in the Taligent environment. But Taligent's software will run on top of PowerOpen, giving users access to Taligent, AIX, and Mac applications. In fact, Taligent's software will run on top of any 32-bit operating system that supports preemptive multitasking, including Apple's Gershwin and Copland. So far, I've seen demos of Taligent's software running on OS/2, Windows NT, AIX, and HP-UX (Hewlett-Packard's version of UNIX).

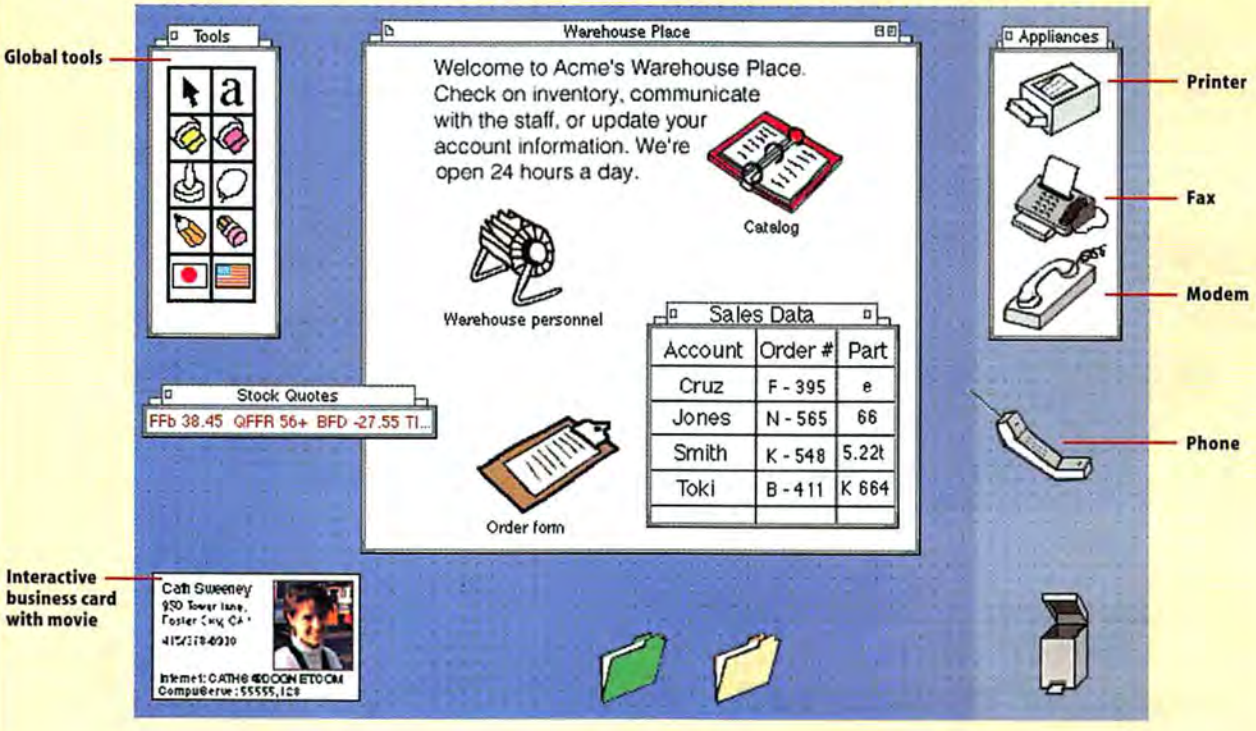
In addition, Taligent's software will run on a variety of hardware platforms, including those based on the PowerPC (Apple and IBM versions), Intel processors, and HP's PA-RISC processors (Taligent is not developing its software for 680x0-based Macs). Conveniently, Taligent-savvy applications running on one system will be able to run unaltered on any other system that's using the same processor — so, for example, an application developed for Taligent's software under OS/2 on an IBM PowerPC-based computer will also run in a Gershwin environment on a Power Mac. To port a Taligent application to a hardware platform based on a different processor, all you'll need to do is recompile it for that platform. This portability between operating systems and hardware makes Taligent's software the most cross-platform-compatible ever developed.

How does Taligent achieve this portability? Like the DOS/Windows environment, the Taligent operating environment consists of two main parts. The core software that communicates with the hardware (the part corresponding to DOS) is Taligent Object Services (TalOS), scheduled to ship in the second half of 1995. Unlike DOS, TalOS is hardware-independent. The part that runs application software is Taligent Application Environment (TalAE), which will ship in the first part of 1995, before TalOS. TalAE will run on top of multiple operating systems, including — but not limited to — TalOS.

Unlike Windows, TalAE is more than a

TALIGENT'S USER INTERFACE / *make way for People, Places, and Things*

TALIGENT'S SOFTWARE is based on a sophisticated new architecture, but the part of it you see will be simple and eminently user-friendly. You won't use *applications* as such; instead, you'll interact with People, Places, and Things. This artist's rendition of the Taligent interface shows a company's warehouse Place, from which a user might order parts, browse through a sales database, or communicate with people at the work site. Multiple live elements, such as a QuickTime video and a continuously scrolling stock-quotation meter, can run simultaneously. Users can also drag data from within the catalog directly to the printer, fax, or modem icon.



GUI. TalAE provides a host of capabilities, including file conversion, client/server communication, and multimedia support, in software building blocks called *frameworks,* so programmers don't have to code them into application software. These frameworks are part of what makes TalAE — and TalOS, since it also consists of frameworks — multiplatform.

Friendly Frameworks

Taligent's frameworks bring capabilities such as networking, database access, and collaboration to the desktop, allowing users to focus more on completing tasks than on using applications. Large, monolithic applications are replaced with elements called People, Places, and Things.

When you first enter the Taligent environment, you see one or more maps (see the "Taligent's User Interface" sidebar). These can be organizational charts, conceptual maps of projects, or actual maps of cities and states. Within a map, you click on a Place and the Taligent software takes you there. A Place can be a representation of a meeting room, office, or any other work environment.

In the Place, you'll find People (other users) and Things (work; data; folders; tools; and icons representing printers, faxes, and other devices). Your company might have a warehouse Place where you check on inventory (remember, database access is built in to TalAE), a human-resources Place with electronic forms to let you sign up for a health plan, and a help-desk Place where you can direct questions to a person. Instead of using an e-mail application, you click on a representation of a person and type or speak. Taligent's software will support current networking, file-storage, and file-format standards, so that other users on the network can be running other operating systems and hardware.

You'll buy Taligent applications as groups of People, Places, and Things elements. A software developer might provide several elements in a specialized Place such as a videoconference room; organizations can also create their own custom Places. In addition, users can create their own Places for storing and organizing projects and data.

Almost everything in the interface is click-and-drag, and you can drag just about anything anywhere. Features such as tool palettes and text editors work anywhere, so each application doesn't have to supply its own. This element of Taligent's technology has some similarities to OpenDoc, the cross-platform component-software strategy from Apple, WordPerfect, and the other members of the Component Integration Labs (CIL) group (see "What's OpenDoc?", April '94, page 119). The goal of OpenDoc, which forms a major piece of Apple's applications strategy for Copland and Gershwin, is to replace large, monolithic applications with sets of interchangeable software parts. In fact, Taligent is a member of the CIL group, and OpenDoc software components (called *parts*) may be compatible with TalAE. Taligent claims that OpenDoc software won't provide users with TalAE's high degree of connectivity, however.

ONE INDUSTRY analyst says Taligent's software was developed for the Arnold Schwarzeneggers of the developer community — when most developers are Tom Arnolds.

Flying Without Wings

At first, the similarities between TalAE and OpenDoc seem to promise an easy migration path to TalAE for developers of today's Mac and Windows applications. This sort of path is necessary to ensure the success of TalAE and TalOS. In fact, Taligent says that a first step for developers in porting their software to TalAE is to convert each application into a set of OpenDoc parts. But the road to TalAE may have some potholes.

A big difference between OpenDoc and TalAE is that you can apply OpenDoc technology to existing applications in existing operating systems; not so with TalAE. This difference is not trivial, according to some major OpenDoc developers, who claim that Taligent has not offered them any practical path for porting their software to TalAE.

The problem — and part of the appeal — of TalAE and TalOS is that the new technology uses a type of programming model that is very different from what most developers are using today. Because the Taligent system software provides so many features in frameworks, Taligent claims that the amount of code required to create software is as much as 90 percent less than in today's Mac and Windows environments. The Taligent frameworks will also allow developers to make revisions much more frequently than they can today. Similarly, TalOS will let hardware developers make frequent changes to computers while still allowing existing software to run.

Taligent won't ship a developer tool kit until after TalAE ships next year, however, and some industry analysts are worried that the present learning curve for developers is too steep. According to Mike West, of the Gartner Group, Taligent's software was developed for the Arnold Schwarzeneggers of the developer community — when most developers are Tom Arnolds. West points out that the lack of easy-to-use programming tools could limit the creation of Taligent applications to a few niche developers. He has a point, since developer tools are the wings that made the Mac operating system and Windows 3.1 fly.

Hold On to Your Hats

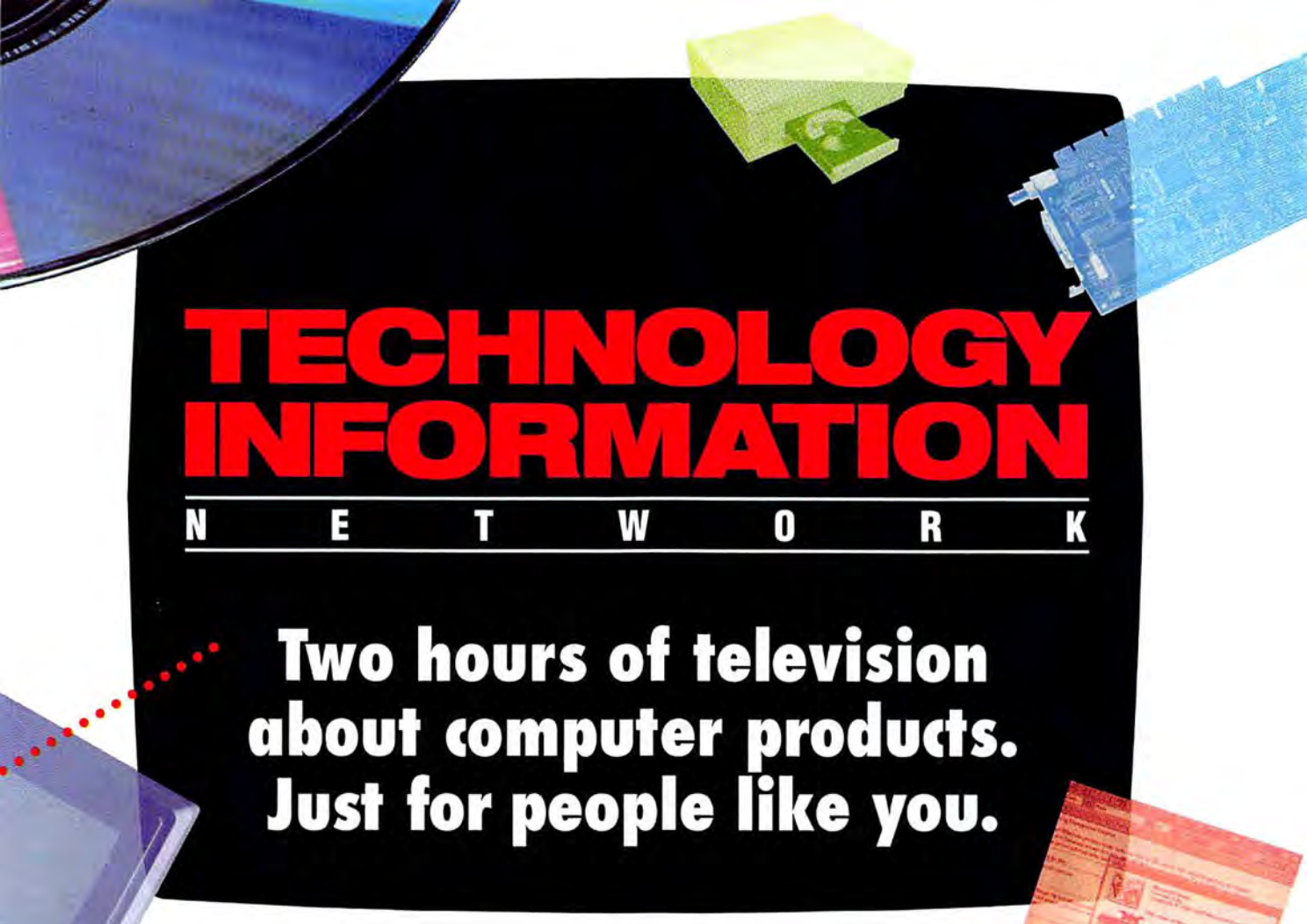
Apple's Gershwin is likely to offer a user interface that's equally as radical as that offered by Taligent's software, although very different. It won't be cross-platform, unless Apple licenses its system software to other vendors — as analysts are hoping it will, for the good of the Mac. Should Taligent fly, the fact that TalAE doesn't take over your native operating system but allows you to run your Mac (or AIX or Windows 4) applications will be a definite advantage for users as well as for Taligent and Apple.

Whether Gershwin, Taligent's software, or both are in your future, one thing is certain: It's time to throw your old notions of computing out the window. Just as we made the quantum leap from hardware-specific mainframe applications to more-portable OS-based applications — and the further leap from text-based applications to those with easier, graphical user interfaces — so we are about to sail forth from the world of monolithic applications into a new era of collaborative, task-based computing. I can't wait for the '90s to begin.

MacUser technical editor John Rizzo is the author of *MacUser Guide to Connectivity* and *How Macs Work* (Ziff-Davis Press).

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By Gregory Wasson



PERSONAL PRODUCTIVITY

THIS YEAR'S hot new trend among our nominations was tools for organizing and working smarter — so we added a new category.

THE WINNER IS . . .

GMS Calendar

(GMSCAL.SIT, Library 1: Applications). Distinguished by its clean interface, GMS Calendar ($25), by Mark Wall, is a System 7 calendar, database, and to-do-list manager. You can enter notes on calendar days and import and export notes from text files. To save space, its window shrinks to the size of an icon when the program is open in the background.

HONORABLE MENTIONS

Eye on the Clock (EYEONT.SIT, Library 1: Applications). Created by Chris and Geoff Hufford, this $5 program displays countdowns to important events, such as the number of days until a project is due or the number of seconds until the weekend.

ProCalc (PROCAL.SIT, Library 1: Applications). This desktop calculator, by John Brochu, stands out because of its 3-D looks and clean, LCD-style numbers font. It costs $20 and requires System 7 or MultiFinder.



GENERAL UTILITIES AND APPLICATIONS

GENERAL UTILITIES make clever use of the Mac to help you work more efficiently. The best ones make you think, "That's how this task should have been done all along."

THE WINNER IS . . .

Greg's Browser

(BROWSE.SIT, Library 1: Applications). This $20 System 7 utility, by Greg Landweber, makes copying, moving, deleting, and renaming files even easier than it is with the Finder. It offers so much more flexibility that you may leave it open all the time. A PowerPC version is also available (PPCBRO.SIT, Library 15: PowerPC Macs).

HONORABLE MENTIONS

PowerLaunch Lite (POWLAU.SEA, Library 1: Applications). Roby Sherman's System 7 desktop file launcher ($20) features an attractive floating palette that provides easy access to applications and documents.

UltraDrop Folders (ULTRAD.SIT, Library 4: Fonts/QuickTime/Art), a free desktop space saver by Michael Smith, shrinks either four or eight icons to fit in the space normally occupied by a single icon.



SYSTEM ENHANCEMENTS

IT'S CLEAR from the nominations in this category that Mac users don't want programs that simply change the way the Mac environment *looks* — they want useful tools that change the way the Mac *works*.

THE WINNER IS . . .

KeyQuencer

(KEYQUE.SIT, Library 3: Extensions). KeyQuencer, a powerful macro engine by Alessandro Levi Montalcini, is the most sophisticated macro shareware to date, yet it uses very little memory. It can perform many of the complex tasks of commercial macro software, such as QuicKeys, but costs only $10.

HONORABLE MENTIONS

ApplWindows (APPWIN.SIT, Library 3: Extensions). This System 7 control panel (free), by Boomerang author Hiro Yamamoto, attaches a handy list of all open windows to the application menu (in the upper right corner of the desktop).

Menuette (MENUET.SIT, Library 3: Extensions). Robert L. Mathews' $15 System 7 extension saves menu-bar space by letting you substitute icons for menu names.

Publishing Tools

THE AVALANCHE OF WORDS and images that enter and leave our Macs every day makes us all de facto publishers. This year's finalists in this category all fall into the text-manipulation area of publishing.



The Winner Is . . .

TypeIt4Me

(TYPEIT.SIT, Library 3: Extensions). Riccardo Ettore's TypeIt4Me extension ($30) brings the power of a glossary to any program. Just type in a two-letter code, and TypeIt4Me replaces it with whatever text you assign, such as a full paragraph, the current date or time, or a return address. This program is such a gem and Ettore is so fastidious about bug fixing and updating that he should be canonized (or the live person's equivalent).

Honorable Mentions

Search Files (SEARCH.SIT, Library 1: Applications). You can find any text in any file on your hard disk by using Robert Morris' Search Files ($12), which forms a list of found text in context. Under System 7, you can double-click on found text in the list to open its file.

Torquemada (TORQUE.SIT, Library 1: Applications). Torquemada, by Greg Swann (free), provides powerful search-and-replace capabilities within text files. You can define as many as 640 search-and-replace criteria, using a sophisticated greplike language.



Educational/Reference

STAYING INFORMED is a top priority among shareware users, judging from the number of reference tools that get downloaded.

The Winner Is . . .

Congress 103

(103CON.SIT, Library 7: Reference). Tom Petaccia put a wealth of information about the members of the 103rd Congress into the two FileMaker Pro 2 databases that make up Congress 103 ($30). You can compile lists of names, prepare form letters, and print labels to keep tabs on and express views to your congressional representatives.

Honorable Mentions

Big Dummy's Guide to the Internet (BIGDUM.SIT, Library 7: Reference). A useful guide to the Internet from those wired folk at the Electronic Frontier Foundation, this free program is all about getting connected and using the Internet.

VendorDA (VENDCO.SIT, Library 7: Reference). This colorful listing ($10), compiled by Bill Baldridge, gives information, including phone numbers, for more than 1,200 vendors of Mac products. A version for monochrome Macs (VENDBW.SIT, Library 7: Reference) is also available.

TELECOM



WITH ALL THE TALK among media mavens and plugged-in politicos about the information highway, it shouldn't come as a big surprise that the winner here is Internet-related. It's also the only winner that's absolutely free.

THE WINNER IS . . .

NCSA Mosaic

(MOSAIC.SIT, Library 1: Applications). Mosaic, created by the University of Illinois National Center for Supercomputing Applications, helps you browse World Wide Web servers (huge databases on the Internet). The beauty of Mosaic is that it gives Mac users the graphical interface they're used to, so they don't have to type UNIX-like command lines to navigate. It requires System 7, MacTCP 2, and a network connection to the Internet.

HONORABLE MENTIONS

Anarchie (ANARCH.SIT, Library 1: Applications). Peter Lewis' $10 Anarchie lets you poll Archie servers on the Internet and retrieve files from anonymous-FTP servers. You'll need System 7, MacTCP 1.1 or higher, and a network Internet connection.

Fetch (FETCH.SIT, Library 1: Applications). Fetch, a freebie from the folks at Dartmouth College, is an FTP client that can send and receive files from various network hosts that support TCP/IP. It requires MacTCP and connection to TCP/IP networks.

TRIVIAL PURSUITS

MAC SHAREWARE GAMES get better and better each year. This year's nominees range from arcade madness to card games.



THE WINNER IS . . .

Chiral

(CHIRAL.SEA, Library 1: Applications). No surprise here — Andrew Welch's Maelstrom won top honors last year. His new program, Chiral ($15), not only follows a popular game format — a cross between Tetris and dominoes — but it also has exceptional sound and graphics. The object is to connect atoms to form stable molecules. You need System 6.0.7 or later and at least 256 colors.

HONORABLE MENTIONS

Hearts (HEARTS.SIT, Library 1: Applications). Hearts ($15), by Ian Lynch Smith, not only puts a popular card game on your Mac but also provides a tutor that teaches you how to play as you go. A color monitor is required.

Missions of the Reliant (MRELIA.SIT, Library 1: Applications). Missions of the Reliant ($15), by Michael Rubin, is a space-based arcade game that tests your reflexes and ability to manage a ship's crew. You need a 13-inch monitor, System 7 or later, and at least 256 colors.

Gregory Wasson is the author of *MacUser Guide to Shareware* (Ziff-Davis Press) and the chief sysop of the ZiffNet/Mac Download & Support Forum. He can be reached on ZiffNet/Mac or CompuServe at 72511,36.

See page 4 for instructions on accessing ZiffNet/Mac, where you'll find these and other popular shareware programs.

Phone-Savvy Traveling



Whether you're staying at a hotel that's telecom heaven or at one that's telecom hell, there's a way to get your PowerBook connected to a phone line — as long as you plan ahead when you pack. BY SHARON ZARDETTO AKER

YOU'VE GOT a modem built in to your PowerBook, and you think you're all set to hook up to a phone system wherever you go. Think again. If it's a place you've never visited before, you won't know what to expect, and calling ahead for information doesn't always work — you don't often get telecom-savvy personnel when you call for a reservation. So let's take a look at the situations you're likely to encounter and how to deal with them.

Easy Does It

Telecom heaven is a hotel that provides phones with a data jack built in. (May I recommend the Disneyland Hotel?) Many convention centers are set up to cater to businesspeople toting computers. The only piece of equipment you need in such a situation is a length of phone wire to go between the PowerBook and the phone. You might want a *long* wire — or two wires and an RJ-11 coupler to connect them — in case the phone's by the bed and you're working at a desk. Here's where I get to recommend the gadget of the month: the PocketNet ($19.95), a 16-foot autoretractable phone wire in a round case about the size of two Oreo cookies, from Pilot Technology (800-682-4987 or 612-828-6002). Note that the wind-up cords you see in phone and general catalogs are *not* the same thing. The PocketNet is for connecting between a phone (or your PowerBook) and a wall jack; the others are extensions for connecting between a handset and a phone.

Second only to the data-jack phone is a standard modular phone, which has an easy-to-get-at phone jack on the back that you can just switch to the PowerBook. Of course, you lose use of the phone that way, so if you want voice capability without having to unhook the PowerBook, you should take along a duplex adapter and two phone wires: The wire from the wall goes to the adapter, and from there, one wire goes to the phone and one to the PowerBook.

Only slightly less convenient is a wire that's permanently connected to the phone, with a modular jack on the wall. You have to do your connecting on your hands and knees under a desk, but a single phone wire is all you need in order to plug in your PowerBook — and one wire plus a duplex adapter enables you to keep the phone plugged in too.

Some hotels use modular phone jacks in the wall but don't want to advertise the fact; the phone looks as though it's hard-wired to the wall, but in fact, the wire simply goes through a wall plate that hides the jack. All you need in such a situation is a flat-bladed screwdriver to get the plate off — and maybe a flashlight if you find yourself working under a desk or bedside unit that's attached to the wall.

The Hard Way

So far, we've had it pretty easy — always a phone jack to be found. But not all hotels use a modular system, even a hidden one, so sometimes you have to tap in to the phone wires themselves. (Of course, remember to put everything back the way you found it before you leave.)

First, the precautions: Working on phone wires that might transmit a ring can be very

POWERBOOK SECRETS / *fixing a broken trackball button*

A SURPRISING NUMBER of upper trackball buttons — the button between the trackball and the keyboard — have been failing on all-in-one PowerBooks. You press the button, and nothing happens — there's no resistance, and you don't hear a click. If your PowerBook's warranty has run out, the fix might run you about $100 — or you can take care of it yourself, with nothing more than a little time, some superglue, and two Torx screwdrivers (sizes T8 and T10).

First remove the trackball, and then, making sure to take the appropriate static-protection steps (that is, work in an environment as static-free as possible and use an antistatic wrist strap), open the PowerBook's case by removing the screws that hold it together. To remove the trackball assembly, gently detach the small ribbon cable (the ribbon cable itself, *not* the connector) going to the unit; you have to pull up on the sides of the connector that's holding it in. Take out the two largest screws on the bottom of the assembly, which hold it onto the PowerBook case, and remove the unit. Then take out the four small screws to remove the circuit board, and set the board aside. Lift out the assembly beneath it.



The assembly you have just removed is the plastic housing for the trackball buttons. On the opposite side from the buttons, you'll see four short, round, waffle-textured posts, which are the undersides of the plastic springs for the buttons; at least one of them has popped off the assembly. Put a tiny drop of superglue under it, and hold it in place for a minute, until it hardens. While you're in there, put a drop on the base of each of the other posts. That's it. Reassemble everything — remembering to reinsert the ribbon cable — and your switch will be as good as new, maybe even better. / Richard Wolfson

dangerous, since a ringing phone can carry a considerable voltage. The level is not a serious consideration in most parts of the U.S., but don't take any chances: You need a *connected* phone, *off the hook*, to keep a ring signal from coming through.

Standard phone wires can have four, six, or even eight wires inside; if you're in a place that has no phone jacks, it's likely you'll be working with a four-wire system, which has been around a long time. The phone uses only two of the wires in any group — almost always the red and the green ones. All you need is something that comes out of your PowerBook's phone port and ends with connectors that can hook up to the separate wires you've exposed in the phone system.

This isn't as complicated as it sounds. First, on the PowerBook end, you need an RJ-11 clip adapter. It has a standard RJ-11 modular clip on one end, which snaps right into the modem port; the wire that comes from the clip splits into two separate wires, each with an alligator clip on the end. (You can buy a clip adapter at most electronics stores, or you can make one, as described in the "PowerBook Secrets" sidebar, July '94, page 141.) Of course, if you're using only the adapter, which is about 6 inches long, to connect to wires in the wall, you'll wind up using your PowerBook while lying on the floor with your head under a desk; so use a length of phone wire in the modem port, and use a coupler to connect it to the clip adapter.

Now, the phone end: Remove the wall plate where the phone wire goes into the wall. Look for the red and the green wires that are connected to terminal screws; sometimes you have to pull out a little block, because the screws are at the back instead of at the surface. Attach one alligator clip to each wire; the polarity doesn't matter — it makes no difference which clip goes on which wire.

If you can't get at the wires at all or if the wall connection is in an impossible spot for working, you can try hooking up to the wires inside the phone. Most tabletop models come apart, at least partially, if you simply loosen the screws on the bottom. You can tap in to the red and the green wires where they come into the phone case. If all else fails, you can try getting at the wires through the handset's mouthpiece: Unscrew the cover, remove the microphone sitting inside it (it usually sits there snugly, with no wires attached), and clip the adapter ends to the terminals inside.

Digitalis

So far, we've been assuming that you're in a place that has a standard analog phone system. The modem's very name comes from the necessity of *mo*dulating and *demo*dulating the computer's digital signal to work on an analog phone line. At first glance, a digital phone system might indicate that we're about to cut out the middleman. No such luck. In fact, a digital PBX phone system spells trouble for telecommunicating, specifically because your PowerBook expects to use an analog translator. If the hotel you're staying in uses a PBX system, you can ask to "borrow" a fax line for your telecom session, since faxes use analog lines. You won't be able to work from the comfort of your room, of course, but you'll get the job done.

If you'd rather be self-sufficient, you can use a handset adapter or an acoustic coupler. The Konexx Konnector 112 ($149), from Unlimited Systems (619-622-1400), lets you hook up through a phone's handset; it's about the size of a deck of cards and connects to both the phone's handset jack and the phone wire coming from the PowerBook's modem. But if the handset is permanently wired to the phone, your only option is to use an acoustic coupler, which cups the ear and mouthpiece of a handset. These devices predate modular phone systems; using one should be your last-choice solution, since you can't always get a snug fit or a noise-free connection — and you won't be able to reliably transmit at faster than 2,400 bps with most of them. For those who must use a coupler, the Telecoupler II ($159.95), from Computer Products Plus (800-274-4277 or 714-847-1799), and the Konexx Koupler 204 ($149) are two good models that can even provide 14,400-bps connections under ideal circumstances.

Longer Distance

If your travels take you out of the U.S. and Canada, even a modular phone system can be a challenge, because it's likely to have a different connector from the RJ-11 we use here. Using an acoustic coupler is an option under these circumstances, but once again, it's not my first choice. TeleAdapt (408-370-5105) provides a connector adapter for any country you can name. You can buy an adapter for a specific country or get the WorldPak, which contains 22 adapters that keep you going in 100 countries. You don't even have to plan that far ahead: Call TeleAdapt the day before you leave for your trip, and it can have the correct connector waiting for you at your destination. How's that for service?

Sharon Zardetto Aker is traveling to a new home this summer, as is Rich Wolfson. By the time you read this, Rich will have rewired the phone system and added a housewide network.

TELECOM TRAVEL ESSENTIALS

TO PREVENT YOURSELF from cursing in vain at a hotel phone that won't let you hook up your PowerBook's modem, pack the following basic items:

- Two 6-foot lengths of phone wire (with RJ-11 clips at each end).





- An RJ-11 coupler (splice adapter).

- An RJ-11 duplex adapter.





- A flat-bladed screwdriver.

- A small flashlight.





- An RJ-11 clip adapter.

With these tools, you can handle all but digital PBX systems (which call for a handset adapter or an acoustic coupler — unless you just ask to use the hotel's fax line) and foreign phone systems, for which you will have to buy specific adapters. / Sharon Zardetto Aker

Help Folder



How readers react when we trash their TVs, how to shrink space-hogging graphics, and how to open stubborn e-mail files. BY ANDY IHNATKO AND BOB LEVITUS / TIPS COMPILED BY CHRISTOPHER BREEN

The Big TV Picture

BOB: In the April '94 Help Folder (page 140), we declared the results of using a TV in place of a Mac monitor "spectacularly unspectacular." Several readers let us know that sometimes that's good enough. Rebecca Ann Penso, computer coordinator for a Los Angeles elementary school, makes the point that institutions on a tight budget can save precious funds by reviving their ancient TVs. She hooks them up to Macs, using Radio Shack adapters and E-Machines' Presentor Plus to get "readable resolution."

Hugh Lovell, of PacTel Meridian Systems, San Ramon, California, gave us a tip on making the best of what you've got: "Use bold, clear type; keep graphics simple and clean; and leave a generous margin to get images that are easy to see from normal viewing distance. Using CV Links, a scan converter from Display Tech Multimedia, gives a steady, flicker-free picture."

There you have it. If you can put up with a little fuzziness for the sake of saving wads of dough and if you follow Hugh's tips, a TV set and an NTSC-output card could be just the ticket.

Overgrown Graphics

Q. When I do up an illustration in Adobe Illustrator, save it as EPS, and place it in a PageMaker document, it takes up a huge amount of space on the page. The graphic itself is the correct size, but the border around it is too big by a factor of 3 or 4. What's wrong?

Julia Kellerman
Fort Meyers, FL



IMAGE COURTESY OF T/MAKER, CLICKART STUDIO SERIES

figure 1 / **To conserve space** around an Illustrator graphic when you place it in another program, first get rid of the extra x-shaped control points.

ANDY: Remember back to those high-school camping trips, when the camp counselor used to tell you, "Take only pictures, and leave only footprints." This same idea can be applied to solve your problem — you're spending too much time in your office daydreaming about your long-past school days and not enough time removing stray Illustrator control points (see figure 1). Often, when you've been heavily editing paths, one or more of those little x-shaped points will remain behind long after the item it defined has passed into the ether. Because these orphans don't affect the printed image, they're easy to miss.

The simple fix: Reopen those gargantuan EPS files, do a Select All, and look for highlighted items far outside the area of the graphic. Zap 'em, and then the file should be both hunky and dory.

BOB: You can use PageMaker's cropping tool

Write to Help Folder/Tips

c/o *MacUser*
950 Tower Lane
18th Floor
Foster City, CA 94404

Don't want to wait for an answer? Post your question on ZiffNet/Mac, *MacUser*'s on-line service, and get a reply from Bob (76004, 2076) or Andy (72511,204). We pay $25 – $100 for any undocumented tips we publish. Send them to Christopher Breen (72241,1036).

TIPS / Telecom

WORDPERFECT AND E-MAIL

You can share Mac files with a PC user only if the files are not MacBinary (a special format Mac telecom programs use when transferring files among remote Macs).

If your Mac telecom software doesn't let you turn MacBinary off, WordPerfect 3.0 can do it instead. Save the file you want to send to the PC user as a DOS or Windows WordPerfect file. Close the document, but don't quit the program. Choose Open from the File menu (or press Command-O), find the file you changed to the PC format, and highlight it. Choose Info from the Open dialog box's File menu. In the Info dialog box that appears, change the file's type to TEXT or DATA in the box at the lower right, and click on OK until all the dialog boxes are closed. You should now be able to send the file without MacBinary getting in the way.

Gregory Wasson
Scotts Valley, CA

SITCOMM MODEM SILENCER

Most people don't like hearing their modem screech when it's connecting. Although most Mac telecom software provides a simple button or toggle that turns the modem's speaker off, Aladdin's SITcomm does not. If you use SITcomm and want to silence that loudmouth modem, begin by opening the Address Book and selecting the service you want to edit. Click on Edit. Click on the tools icon in the scrolling list, and then click on the Connection button. Choose Custom from the Modem Options pop-up menu. Add the letters MO to the end of the line of code in the Initialization box. Once you've saved your changes, you can dial in peace and quiet.

Lila Garrison
Lubbock, TX

to make the bounding box smaller if you want to avoid the trip back into Illustrator to hunt and kill the errant x-shaped points.

Thanks for the Memory

Q. Does allocating more preferred memory to a program (in the Get Info box) make it run faster? And if so, can I maximize speed by using virtual memory and boosting Photoshop's preferred memory to equal the amount of virtual memory? Or will that cause problems?

Louis Dachis
Minnetonka, MN

BOB: It'll cause problems. Photoshop has its own implementation of virtual memory, employing a scratch disk (temporary storage space on your hard disk created by an application). Using other virtual-memory schemes, such as Apple's or that of Connectix's RAM Doubler, in lieu of using real RAM will degrade Photoshop's performance. You can, however, use a virtual-memory scheme to keep other applications open at the same time that you're using Photoshop. You still need to restrict Photoshop's preferred-memory size to the amount of real RAM.

As to your general question, allocating more preferred memory to a program usually speeds it up.

ANDY: Right. Allocating extra RAM to an application is a good idea, because it means the app won't have to access your hard disk as often, an activity that puts performance through the meat grinder.

BOB: There's definitely a point of diminishing returns, though. Bumping up the preferred-memory size by 20 to 50 percent makes most programs run as fast as they're ever going to, unless you're dealing with very large files, such as graphics, QuickTime movies, animation, and sound.

ANDY: Also, keep in mind that boosting preferred memory is a technique whose results vary from app to app. That's why whenever I install new software, I experiment to find the best allocation for the combination of programs I use.

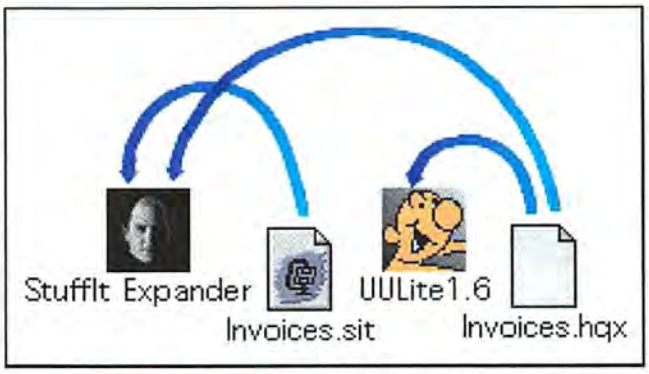


figure 2 / **To decode e-mail files** from on-line services and the Internet, just drag and drop the files onto the icons of specific shareware utilities, such as Jeff Strobel's UULite or Aladdin's StuffIt Expander.

E-Mail Decoder Ring

Q. How can I use the graphics files and whatnot that I've been downloading from Internet newsgroups and receiving through e-mail? I know Photoshop can open GIF and JPEG files, but it keeps telling me the files can't be opened.

Marcus Kvamme
Beaverton, OR

ANDY: Your question is a new shade on an old problem — how to take the binary structure of a file and transmogrify it into a text format that mail systems can easily handle. On the Mac, we have BinHex, which handles the transmogrification on both the sender's and the receiver's end and is even neighborly enough to stick the phrase "This file must be converted with BinHex 4.0" right into the text, so you know how to turn your e-mail message into a GIF file.

Unfortunately, uuencode — UNIX's answer to converting e-mail files — isn't quite as friendly. The only thing that will enable you to know you need to use uuencode is the presence of `begin <filename>` and `end` framing the data you receive.

Fortunately, there's a shareware utility — Jeff Strobel's UULite (available from on-line services; on ZiffNet/Mac, it's UULITE.SIT, in the Download & Support Forum, Library 1 [Applications]) — that does the dirty work of decoding uuencoded files so you don't have to (see figure 2).

BOB: Swoon. I love it when Andy uses those big words. Two forms of *transmogrify* in one reply — way to go, And-o-rama.

Don't forget about the freeware program StuffIt Expander, written by Leonard Rosenthol. It can turn those huge concatenated text files into regular Mac files too. It's one of those neat new drag-and-drop programs, so I keep it on my desktop and drag all my stuffed, compacted, packaged, and BinHexed files onto it for automatic decoding. And it's freeware, so the price is definitely right. It's available from Aladdin Systems (408-761-6200), or you can find it on ZiffNet/Mac in the Download & Support Forum in Library 2 (Shareware Awards); filename STUFEX.SEA.

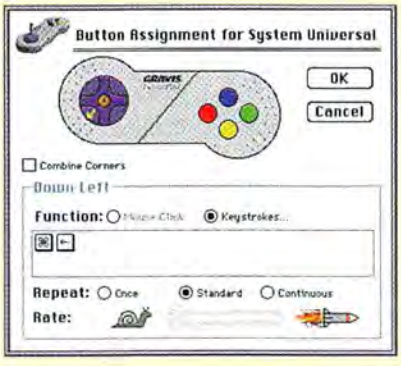
Cache-Flow Shortage

Q. Most of the programs I used on my 68000 and 68030 Macs don't work on my shiny new 68040 LC 475. The only thing that

TIPS / Input Devices

GAMEPAD FOR PRESENTATIONS

If you prefer to stroll while giving a slide-show presentation, you can use Advanced Gravis' GamePad as your controller instead of a keyboard and a mouse. The GamePad's four buttons and directional controller with eight options can be assigned the functions of single keys or key combinations. I use the four buttons to execute such commands as Open, Close, and mouse click. And I use the movement pad to navigate through slides and dialog boxes by using each directional option as a different arrow key or Command–arrow-key.



The GamePad also makes a good substitute for the function keys of an extended keyboard if you have to work with a standard keyboard — if you use a PowerBook, for instance.

Christopher Breen
Contributing editor, *MacUser*

TIPS / Graphics and Scanning

ADOBE ILLUSTRATOR TEMPLATES

You'll get a great degree of detail when using a scanned color photo as a template in Adobe Illustrator if you use this Photoshop trick. Rather than scan the photo in as a 1-bit PICT file, try this:

1. Scan the color photo (300 dpi or higher), and save it as a color TIFF image.

2. In Photoshop, convert the image from RGB to CMYK.

3. Split the channels, by choosing split channels from the Channels menu, and save the black channel as a PICT file.

4. Now use the black channel as your PICT template in Illustrator.

Your template will look much better now than if you had scanned the color photo in as a black-and-white file.

Shane Spencer
Ottawa, ON
Canada

helps is using the Include Cache Switch or the CacheOut control panel I got from an online service. But because I have to add most of my programs to the control panel's "cache off" list, all of my programs, except the Finder, run at 68030 speed. Are there applications that support the 68040's cache?

Je-Ho Han
Seoul, South Korea

BOB: Almost all software sold these days supports the 68040's internal cache. My guess is that you need to update your favorite programs.

The problem is that darn 68040 processor. Its internal cache works differently from those of earlier 680x0 chips, and it causes many old or poorly written programs to crash.

Until you can make the investment in the latest and greatest versions of your favorite software, your best option is the one you've discovered — turn off the cache to run those old programs.

ANDY: Leave no stone unturned when you're trolling for incompatible software. It could be that the incompatibility is coming not from your favorite applications but from software you usually don't see, such as system software and SCSI drivers. Almost everyone, at one point or another, has spent hours tracking down the source of a Nosferatu-scale crash, only to discover that one of these hidden bits of software is out-of-date.

Install the latest system software, and format your drive with the most recent version of Drive7 (Casa Blanca Works, 415-461-2227) or Hard Disk ToolKit (FWB, 415-474-8055), and you ought to be golden.

Finally, for the programmers in the audience, this just proves the point that for the most part, when you play by the rules, your software won't crash. I have software written in 1983 — yes, 1983 — I use for testing that still runs fine, even under System 7 Pro on a Power Mac.

TextWar

Q. What exactly is the purpose of TeachText, anyway? As far as I can tell, it's almost completely useless.

George Feynstein
Troy, NY

ANDY: Well, why are *any* of us here? Do you think the Earth would slip from its orbit if you or I suddenly ceased to exist? In the cosmic scheme of things, you, I, and TeachText are all about as significant as a poppy seed making its way down the digestive tract of a grazing gazelle, and the sooner you realize that, the better off you'll be.

I'm sure you already know TeachText's real purpose — to open Read Me documents that come on the installation disks of most commercial software. A plain-text editor is useful for other tasks if it's got more features than TeachText has. BBEdit, from Bare Bones Software (call 508-651-3561, or search for it on-line as BBEdit Lite; the ZiffNet/Mac filename is BBLITE.SEA, and it's in Library 2 [Shareware Awards]) is designed for editing source code. BBEdit also gives you extra features such as the ability to change fonts and font sizes, and it does a diesel-powered search-and-replace.

I always keep it open on my desktop, so I can type in a quick phone number, date, or factoid without having to launch a new program. I use other BBEdit files to replace the Scrapbook, to read and print files that originated on DOS or UNIX systems (word processors attempt to pretty those files up and, in doing so, ruin the formatting), to compose e-mail messages, and to write scripts. With one box of BBEdit and a store-bought crust, you can make a delicious and economical mock-Apple pie.

BOB: TeachText and SimpleText (Apple's minor improvement over TeachText) have one thing going for them — they open really fast, even on slow, old Macs. But that's because they're practically featureless. Sure, SimpleText supports sound and fonts, but it has no Find command, no search-and-replace, no ability to change font sizes.

So why does Apple bother? To ensure that when you double-click on a Read Me file, it opens. And since Apple charges developers some laughably tiny sum — about $100 a year — to include TeachText or SimpleText with their products, they create their Read Me files in one of those formats and then

TIPS / Graphics and Scanning



PHOTOSHOP SCANS

Here's a simple way for Photoshop 2.5 users to straighten crooked scans:

First, enlarge the canvas size in the Canvas Size dialog box (go to the Image menu to find it). Make the canvas size large enough that you won't have to cut portions of your image when you rotate it. Use the cropping tool to outline the scanned image.



Rotate the outline by holding down the Option key while dragging one of the corner points of the cropping outline. Keep dragging until you've lined up one of the sides of the outline with an edge in your image that you want to appear horizontal.

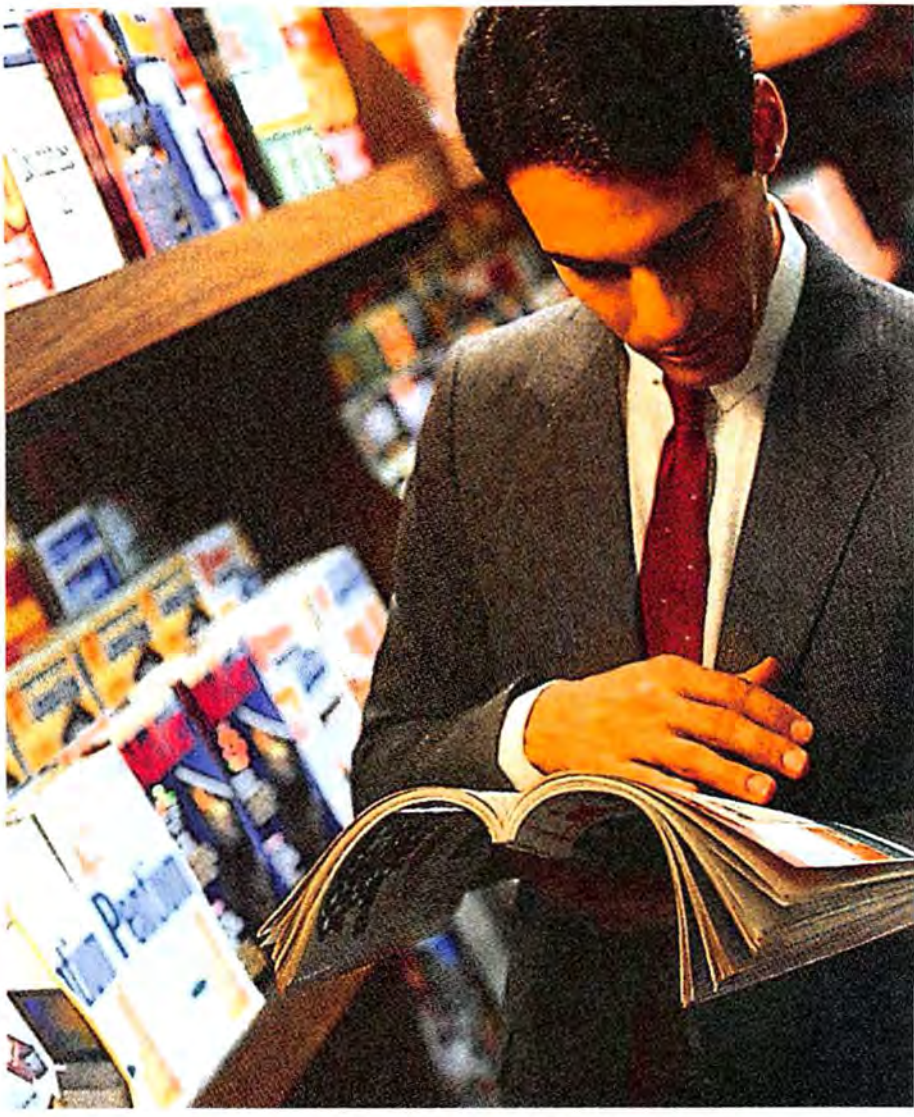
Extend the cropping outline to avoid cutting off any of your object, and then click inside the selection. Photoshop will now crop your object as well as perform the proper rotation.



John M. Stafford
Alexandria, VA

CHOOSY BUYER

LET'S FACE IT, today's business computer market is no picnic. In fact, with so much competition, product advertisers are finding it increasingly important to reach committed business buyers without waste. So when buyers cite certain magazines—Ziff-Davis magazines to be exact—as their preferred choice for purchasing information, advertisers take note. And action.



Business buyers who are involved in selecting computer products for their companies have a weighty responsibility. They must choose wisely. Because the wrong system, software or peripheral can lead to costly, career-threatening mistakes today and down the road.

In over 60 independent studies since 1987, buyers cite Ziff-Davis magazines as their preferred choice for purchasing information.



These buyers need timely, objective news and reliable product evaluations to guide their purchasing decisions. Which makes them very choosy about where they get their information.

They know some publications meet their needs better than others. Those are the ones they turn to first, trust the most and spend the most time reading.

Independent studies confirm that buyers prefer Ziff-Davis magazines.

In more than 60 independent studies conducted over the past six years, buyers have cited Ziff-Davis magazines as their number one choice for purchasing information. In many cases, Ziff magazines have been their choice by 2-to-1 or more over their nearest competitors.

Whether they've been selected at trade shows, from vendors' lists or

S CHOOSE ZIFF.



from user groups, buyers have consistently named our magazines as "most useful", "most authoritative for labs-based product reviews" and "best at delivering timely news and analysis."

Top editorial, top labs.

Our popularity has been earned through the efforts of the largest, most distinguished editorial staff in the industry. Their unmatched technology and business solutions expertise has resulted in thousands of pages of quality journalism to inform and assist buyers with their decisions.

And all of our editorial is supported by the extensive product testing that comes from four magazine-specific labs plus ZD Labs, the world's largest independent computer testing facility.

#1 with advertisers, too.

When you're number one with buyers, it's not surprising that marketers also make you first for advertising. After all, what better place is there for their messages to be seen and read? For the first 5 months of 1994, 46% of all advertising in major computer publications ran in seven Ziff-Davis magazines. The rest of the advertising was scattered among 15 other publications.*

Why do advertisers so overwhelmingly prefer Ziff-Davis magazines? Quite simply, they work. Advertisers know the magazines deliver those choosy business buyers who buy their products.

And to help them reach these buyers more effectively, we've created The Ziff-Davis Magazine Networks—an integrated, complementary set of publications that address every key person involved in the buying process.



So if you want to reach committed business buyers, choose the computer publications that business buyers choose first: Ziff-Davis magazines.

To learn more, call 212-503-5650.

ZD The Ziff-Davis Magazine Networks

* Source: Adscope/ZD Marketing. © 1994 Ziff-Davis Publishing Company. All rights reserved.

throw in a copy, just in case you don't already have one. That's why copies of TeachText and SimpleText multiply on your hard disk like wire coat hangers.

Mr. Microphone

Q. Even when I turn the volume way up on my Performa 475 while recording with a microphone, all I can hear is a faint whisper when I play it back. I can only sort of make out my voice. What on earth is wrong?

Jason Tyree
Turlock, CA

BOB: You can't use just any old microphone with the Performa 475 (or with the Quadra 605, AV Macs, Power Macs, the LC 475, 500-series desktops and PowerBooks, or the Color Classic, for that matter). According to certified Mac audio genius Craig O'Donnell (author of *Cool Mac Sounds*, second edition [Indianapolis, Indiana: Hayden, 1993]), the Performa 475 has a line-level input that requires the Apple PlainTalk Microphone (about $30 from dealers) (see figure 3). Your only other option is to buy a mixer, but be aware that it will cost you two to three times as much.

Shoo Font, Shoo

Q. I have tried getting rid of all but my favorite fonts to save hard-disk space and memory. Even though I've deleted Monaco and Chicago from my Fonts folder, I can't seem to keep them from showing up in my word processor. How can I remove them for good?

Charles Drawdy
Alexandria, VA

BOB: Not only are Monaco and Chicago ugly fonts but they're also permanently installed deep within the bowels of your Mac's ROM (read-only memory). They'll never die, because your Mac must have them for dialog boxes, menus, and alerts. You've already done the best you can by getting rid of the versions in your Fonts folder to save space.

ANDY: You can make your system ignore the fonts burned into ROM by using ResEdit to install a bunch of ROV# resources. In truth, this is a practical solution only if your ultimate goal is to win a bar bet. It'll save you a piddling 40K or so of storage. This sort of system micromanagement was a vital topic back when you had only 400K for your System, the Finder, your word processor, and all of your files, but nowadays there are better ways to waste an hour or two.

Frosty, the PowerBook

Q. I have to take my PowerBook along on field calls where the temperatures don't exactly fall within Apple's recommendations. How much damage can I do to my PowerBook 180 by using it in just-above-freezing temperatures?

Jack Parieve
Eau Claire, WI

ANDY: As much damage as you want — it's your PowerBook, after all. Just don't expect Apple to fix your 180 under warranty after you've dunked it in liquid nitrogen.

There are at least four dangers in exposing your PowerBook to extreme cold — five, if you include the distinct danger of your tongue freezing to the metal contacts of the computer's battery whenever you lick it:

1. Your batteries just plain don't want to work in cold weather. You will be lucky to get ten minutes of use out of a cold battery.

2. Long-term exposure of the LCD screen's liquid medium to the cold can potentially damage the display.

3. and 4. The abrupt temperature change when you bring a frosty PowerBook into your heated office can result in condensation and, in extreme cases, a shattered screen.

To avoid these problems, put your batteries under your



figure 3 / **An Apple PlainTalk Microphone** will give you easy-to-hear playback of sounds recorded on newer Macs.



TIPS / PowerBook

TRACKBALL REPAIR

If the cursor on your PowerBook gets hung up — for instance, the cursor goes down the screen but not up — check to make sure the little blue rollers under the trackball are centered correctly. To take out the trackball, twist the ring rimming the trackball a quarter turn counterclockwise. You should be able to lift off the ring and remove the trackball. If one of the rollers is off to the side of its metal pin, just push it back into place.

Sather M. Ranum
Belvidere, IL

PORTABLE LIGHT TABLE

Doing an electronic slide presentation on a PowerBook is not always practical, but your PowerBook can serve as a helpful aid if you convert it temporarily into a light table.

Place a thin book under the PowerBook to tilt the screen to horizontal (Duos have more-flexible hinges and don't require a book), turn the contrast all the way up, and set the backlight to maximum brightness. This will help you arrange your slides in the right order for the presentation as well as ensure that you don't reverse any slides when you put them into the tray.

Douglas Broussard
New Orleans, LA

SCREEN CLEANING

Here's a quick-and-dry tip for cleaning a PowerBook screen: *Lightly* drag the sticky end of a sticky note, such as a Post-it, across the screen to remove dust. It's also a great way to get into those hard-to-reach corners.

Paul Moniz
Fort Washington, MD

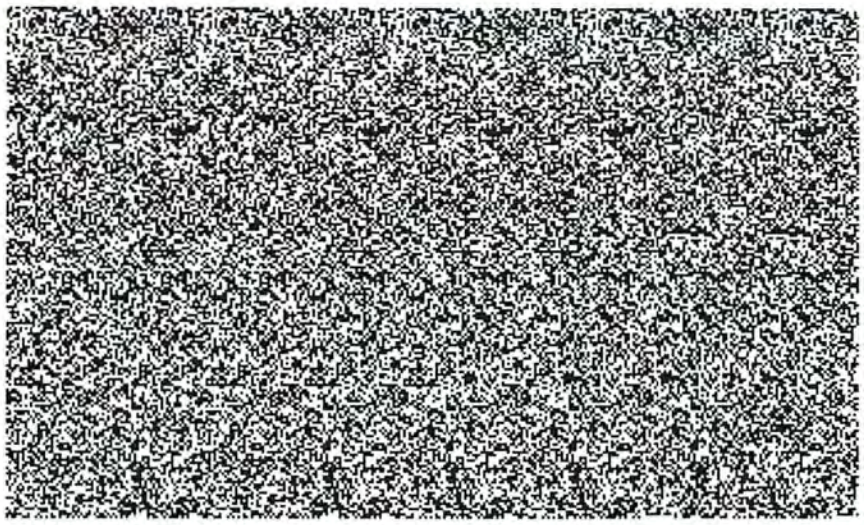


figure 4 / **Solve the "mystery"** of this stereogram, created with Mac software, and win a T-shirt.

coat to keep them warm until you actually need them. You can prevent condensation and cracking by avoiding painfully quick temperature changes or by taping desiccating packets (those little things that come with your stereo that look like sugar packets stamped with "DO NOT EAT!") inside your PowerBook's case to eat up moisture.

BOB: A padded PowerBook bag may provide some degree of insulation as well. Tenba (212-334-0841), longtime maker of insulated camera bags, sells padded cases for PowerBooks and other Macs. Besides cases, it sells a zippered insert for around $30 that guards against condensation. Also, any good camera shop should have a wide selection of padded bags. At least one of them ought to have a padded PowerBook-sized compartment.

3-D Without the Glasses

Q. Is there an application out there that will allow me to design and print the type of 3-D graphics that require you wear special red/blue glasses to see the effect?

Charles Katt
Mipple City, MN

ANDY: First off, Charles, I want to apologize for taking four years to answer your letter. When I got your letter, there were no applications that did what you asked. I thought I could write my own code, but it only sorta worked, and — dang it— "sorta" just isn't good enough here at Help Folder!

So there the matter rested until HSC Software (310-392-8441) sent me a copy of Kai's Power Tools 2.0 ($199) with its fantabulous 3D Stereo Noise drop-in filter for Photoshop. If you have a black-and-white image, this filter allows you to lighten the objects you want to appear "closer" to the viewer, for a 3-D image similar to what you're looking for. Instead of using 3-D glasses, you stare at the image, focusing just past it, until it suddenly and dramatically pops into three dimensions.

Figure 4 contains a three-dimensional message of universal peace and brotherhood. Here's the challenge: The very first two people to tell me what it is (one of them via mail and another via e-mail at 72511.204@compuserve.com) will receive a limited-edition *Macintosh Book of the Dead* T-shirt.

Fuller Floppies

Q. When I format floppy disks that are supposed to have a 2-MB capacity, why do I always end up with only 1.4 MB of available storage?

Jack Mullins
Scottsdale, AZ

BOB: There ought to be a law! What you've observed here is absolutely correct and borders on deceptive advertising. Technically, the disk makers are not actually *lying* — the unformatted disks are indeed capable of holding 2 MB of data. But when you format them, the formatting information itself chews up .6 MB, which leaves only 1.4 MB for your data.

Numerous hard-drive vendors use the same deceptive terminology. For example, when you buy what is advertised as a 240-MB hard drive, the disk often provides less than that after it has been formatted.

ANDY: Well, I wouldn't call it *deceptive.* It's like renting an office that has 5,000 square feet of space and winding up with only 4,000 to walk around in after you've put in your bookshelves, desks, espresso machine, and Twister mat.

TIPS / System Software

MEMORY-ALLOCATION UPDATE

The System 7 Finder doesn't always update memory allocation when you quit some, but not all, of your applications. The way you can tell is that the largest memory block available, displayed in the About This Macintosh dialog box, doesn't equal the total memory minus the memory used by the open applications.

Rather than having to quit all the programs or restart your computer to free up memory, save all changes in the files you have open, go to the Finder, and then try using System 7's Force Quit command (Command-Option-Escape). If a dialog box comes up asking you if you want to Force Quit the Finder, click on the Force Quit button. (If it asks if you want to Force Quit one of the other applications you have open, cancel and try again.) This technique often forces the Finder to update memory allocations.

Caution: Forced quits can make your Mac unstable.

L. Eugene Barnes
Lawrence, KS

SYSTEM 7 SCSI

You don't need a special SCSI utility, such as SCSIProbe, to find the SCSI ID of mounted SCSI devices (under System 7 or later), because the ID number is listed in the Where field of the device's Get Info box. Simply highlight the desktop icon of the mounted volume and press Command-I to open the Get Info box. If the SCSI device is a hard drive whose disk is partitioned into several volumes, each of the volumes will show the same ID.

Luis Ramirez
Anaheim, CA

MacUser

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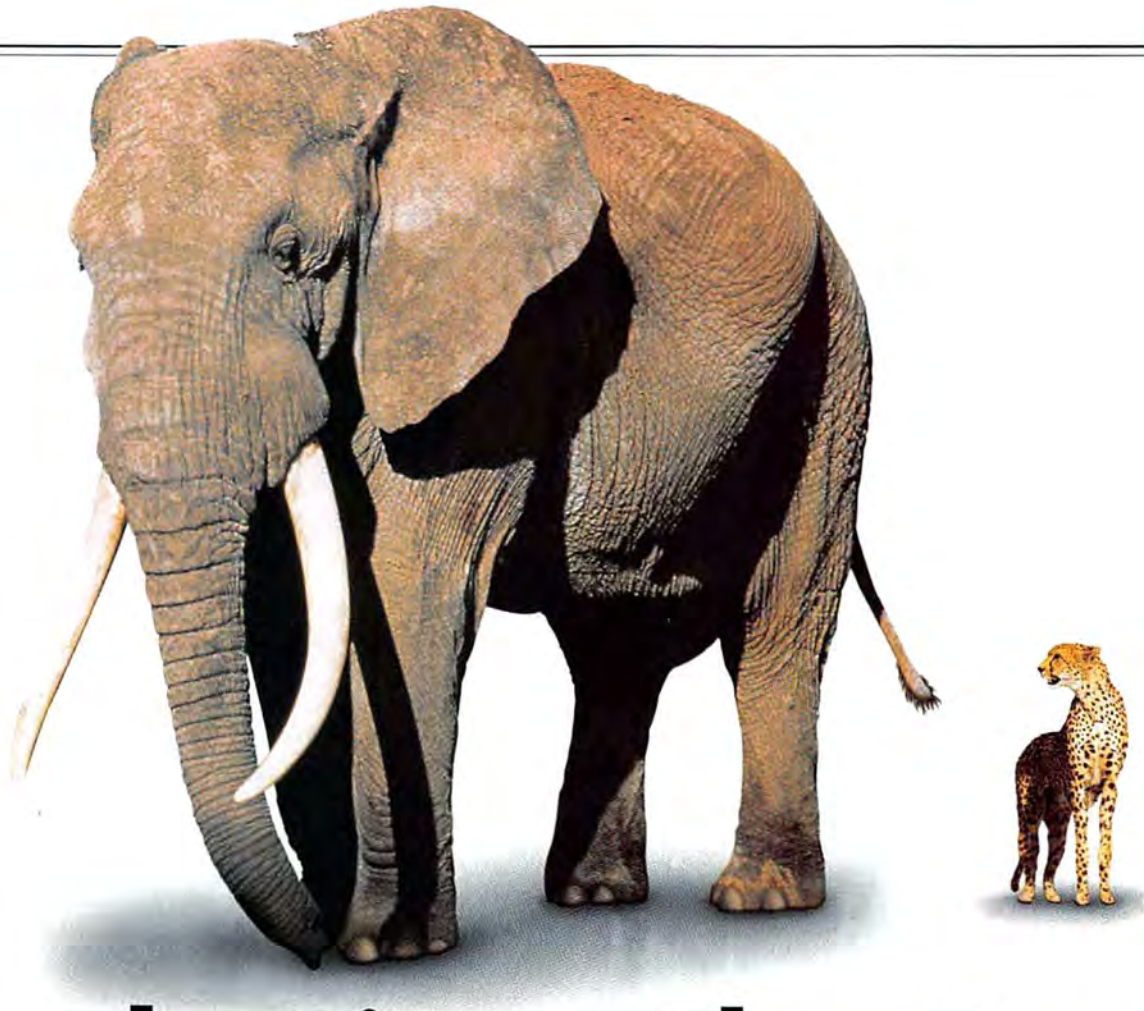
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Direct Line

MAIL ORDER SECTION



For many of you, mail-order is your primary means of purchasing Macintosh products and services. That's why MacUser has put together the following special section. Direct Line offers a convenient place to quickly find the products you need from the vendors you want to buy from. But before you shop by phone, look for the mail-order company that is best for you. Here are a few tips to help you get the most out of your buying experience.

How to Buy Mail Order Products

Research The Company

Well-established companies tend to be reliable, but if you're not sure how well established a company is, it pays to do a little research and ask a few questions.

Know What You Want

Know exactly what you want before you call. Magazines, on-line forums, and user groups are all good places to seek advice.

Check Compatibility

To avoid having to return merchandise, find out whether the product you're interested in is compatible with your system.

Pay With Credit

Whenever possible, use a credit card. Some credit-card companies do such things as double your warranty or give you a refund if you find a lower price elsewhere. If you have a problem, your credit-card company will deal with the mail-order company.

Confirm Prices

Confirm the price when you place your order, including delivery charges. Some companies will waive the delivery charge.

Delivery Methods

Ask about delivery methods — find out what carriers are used, how fast they are, and how much each one costs. Record delivery information.

Return Policies

Because you're buying sight unseen, make sure the company has a return policy you're comfortable with. Find out if you're responsible for paying shipping charges on returned goods and whether you'll be charged a restocking fee.

Check Packing Slips

Before you use your new merchandise, make sure it's exactly what you ordered — the correct model or version number, for example. It's easier to return goods before they've been unpacked.

Repair/Replacement Services

If you're buying hardware, find out how the company handles repairs or replacements.

Technical Support

Technical support varies from company to company. Make sure you know what help is available.

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- Our 8th year selling quality drives at incredibly low prices.
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MegaHaus is your #1 source for Quantum drives.
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- Same day shipping on most orders!

Capacity	Speed	RPM	Buffer	Wty	Model	Internal	External
170MB	17ms	3600	32K	2yr	ELS170S	$179	$239
270MB	12ms	4500	128K	2yr	LPS270S	$229	$289
340MB	12ms	4500	128K	2yr	LPS340S	$275	$335
540MB	12ms	4500	128K	2yr	LPS540S	$329	$389
540MB	9.5ms	5400	512K	5yr	EMP540S	$509	$569
1080MB	9.5ms	5400	512K	5yr	EMP1080S	$669	$729
1440MB	9.5ms	5400	512K	5yr	EMP1440S	$879	$939
2160MB	9.5ms	5400	512K	5yr	EMP2160S	$1179	$1239

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MegaHaus is your #1 source for Syquest drives.
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Genuine Syquest Media Qty 5 or w/ purchase
44MB $59
88MB $68
105MB $56
200MB $79
270MB $69

Capacity	Speed	Compatible	Model	Buffer	Internal	External
88MB	20ms	44, 88MB	SQ5110C	32K	$359	$415
105MB	14.5ms	105MB	SQ3105S	64K	$265	$329
200MB	18ms	44,88,200MB	SQ5200C	64K	$449	$519
270MB	13.5ms	105, 270MB	SQ3270S	128K	$429	$489

FUJITSU HOT SPECIAL!

- High quality Japanese made hard drives!
- 3yr warranty on 530MB, 5yr on 1080MB!
- Low price guarantee!

Capacity	Internal	External
530MB	$339	$399
1080MB	$639	$699

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- High performance optical drives.
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Capacity	Model	Internal	External
128MB	SS5128	$649	$699
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1.3Gig	SS51300	$2199	$2269

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DRM604X, 6 Disc, Quad Speed	$1159
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- We will beat any advertised Micropolis price.

Capacity	Model	Internal	External
1000MB	MC4110AV	$749	$819
1700MB	MC2217AV	$989	$1059
3000MB	MC1936AV	$2059	$2179

HARD DRIVES

Capacity	Speed	RPM	Buffer	Brand	Warranty	Internal	External
240MB	14ms	4500	256K	Fujitsu	1 Year	$299 (2.5" for Powerbook)	
530MB	13.8ms	4500	256K	Fujitsu	3 Years	$339	$399
720MB	12ms	4500	192K	IBM	2 Years	$479	$539
1052MB	8.5ms	5400	256K	Micropolis	5 Years	$669	$729
1080MB	9.5ms	5400	256K	Fujitsu	5 Years	$639	$699
1750MB	10ms	5400	256K	Micropolis	5 Years	$909	$969 BEST BUY!
2040MB	9.2ms	5400	512K	IBM	5 Years	$1249	$1299
2145MB	8ms	7200	1024K	Seagate	5 Years	$1399	$1499
2148MB	9ms	5400	512K	Seagate	5 Years	$1259	$1349
3020MB	11ms	5400	256K	Micropolis	5 Years	$1959	$2029
4250MB	11ms	5400	1024K	IBM	5 Years	$2239	$2339
4290MB	9ms	5400	1024K	Seagate	5 Years	$2249	$2349
4290MB	8ms	7200	1024K	Seagate	5 Years	$2399	$2499
9100MB	10ms	5400	256K	Micropolis	5 Years	$3999	$4099

Includes formatting software and cables. We stock multiple bay enclosures for custom configurations.

CD ROM DRIVES

Brand	Model	Speed	Transfer	Buffer	Internal	External
Toshiba	XM3401	200ms	330KB/sec	256K	$299	$369 BEST BUY!
NEC	CDR510	195ms	450KB/sec	256K	$419	$449
Plextor	4PLEX	150ms	600KB/sec	1MB	$549	$609

Includes driver software with music play, $25 Photo CD processing coupon, and cables. Multi Drive CD Towers in stock!

TAPE DRIVES

Capacity	Type	Brand	Internal	External	Capacity	Type	Brand	Internal	External
250MB	QIC 150	Archive	$459	$529	4-8Gig	DDS DAT	Conner	$939	$999
580MB	MiniCart	Teac	$539	$599	4-8Gig	DDS DAT	HP	$1029	$1079
.75-1.5Gig	MiniCart	Exabyte	$589	$649	4-10Gig	DDS2 DAT	Sony	$1079	$1139
2Gig	DAT	Conner	$819	$869	4-10Gig	DDS2 DAT	Conner	$1069	$1129
2Gig	DAT	HP	$929	$979	4-10Gig	DDS2 DAT	HP	$1299	$1349

Includes Retrospect 2.1, 1 tape, and cables. OPTIMA DeskTape Software mounts DAT on desktop $289.

OPTICAL DRIVES

Capacity	Speed	Brand	Cache	External	Capacity	Speed	Brand	Cache	External
1.3Gig	23ms	HP	512K	$2399	1.3Gig	19ms	Maxoptix	4MB	$2489

Includes formatting software, 1 disk, and cables. 256MB Fujitsu and 650MB HP models also in stock.

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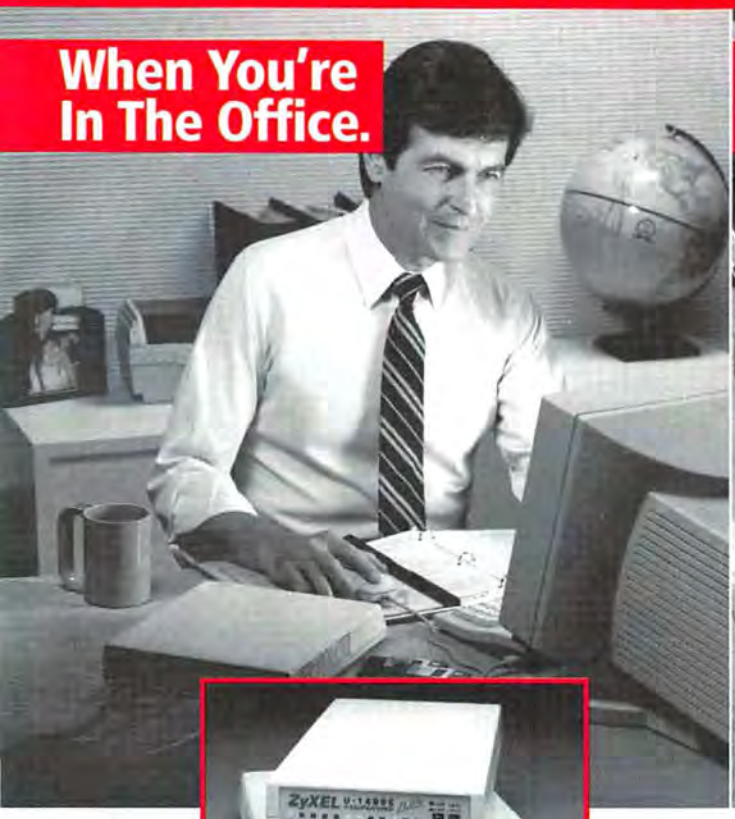
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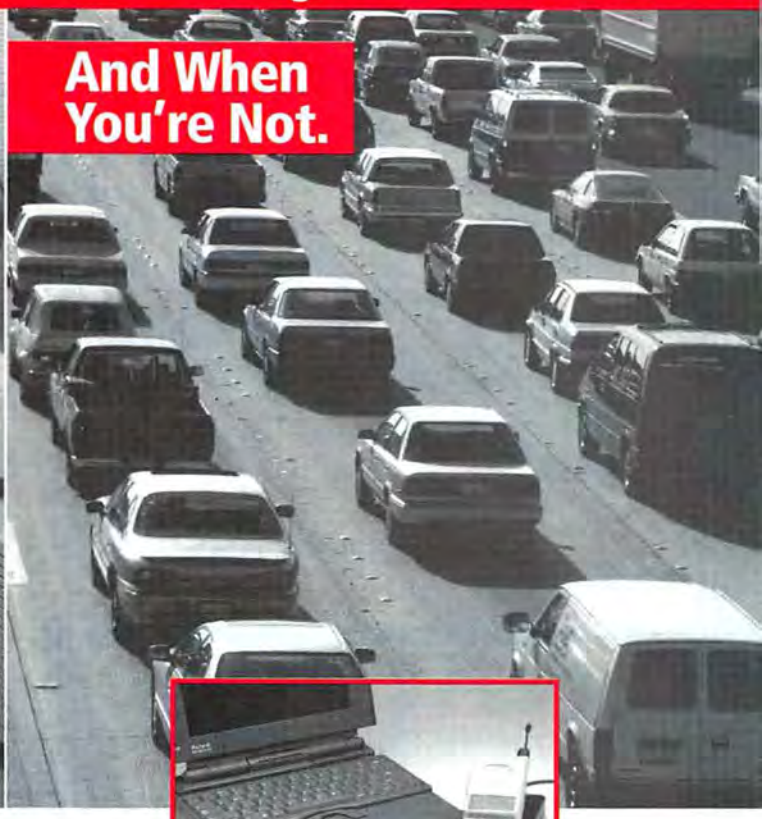
When You're In The Office.





ZyXEL desktop modems offer high reliability without high cost.

And When You're Not.





The new ZyXEL portable — the first autoswitch modem for land and cellular lines.

Some modem users don't care if their data gets hung up, transmits inaccurately, or if they have to redial several times. Most modem users do. For them there's ZyXEL, the full-featured fax modem for serious Macintosh users.

ZyXEL land and cellular modems get through where others fail. They're specially designed to overcome poor signal conditions on the physical layer with features like fast retrain and auto fall-forward/fall-back. This means ZyXEL Macintosh modems connect the first time and continue to transmit data accurately at ultra-high speeds up to 19.2Kbps* over land lines (with DTE speeds up to 76.8Kbps) and 14.4Kbps over cellular networks. Fax speed is 14.4Kbps/V.17. It's the kind of performance you only expect from high-priced modems—but with ZyXEL it doesn't cost more.

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ZyXEL modems will also work in other environments—DOS™, Windows®, OS/2®, NeXT®, UNIX® and Amiga™. So get serious about saving time, cost and effort with *true* Macintosh modem reliability. Don't wait.

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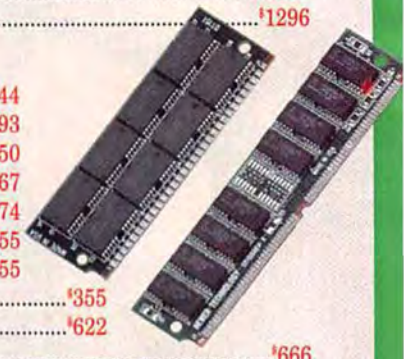
MEMORY

Power Mac, Centris, Quadra, LC III, Performa 32-bit Memory

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8MB–70ns/8MB–60ns	$328/$336
16MB–80/70/60ns	$631/$645/$672
32MB–70ns/32MB–60ns	$1282/$1333
16MB–70ns (LC III)	$652
32MB–70ns (LC III)	$1296

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1x8x70	$44
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4x8x70 (II,IIx)	$167
4x8x70 (IIfx)	$174
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8x8x70 (IIfx)	$355
8x8x70 (Radius Rocket)	$355
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16x8x70 (IIfx)	$666
16x8x70 (Radius Rocket)	$672



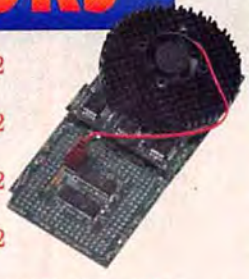
VRAM

256K VRAM	$22
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PRINTER MEMORY

Laserwriter 810–4MB	$239
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ACCELERATORS



Variable Speed Overdrive–Quadra 700/900..... $182
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VSO–Quadra 950..... $182
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POWERBOOK MEMORY



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PB160/165/80–2/4/6/8/10	$72/$128/$185/$241/$298
PB165/180c–2/4/6/8/10	$79/$156/$233/$322/$410
PB520–540c–4/8/16/32	**$202/$407/$803/$1575**
PB210–280c–8/12/20/28	$413/$593/$935/$1435
Base Module–4/12	**$224/$742**

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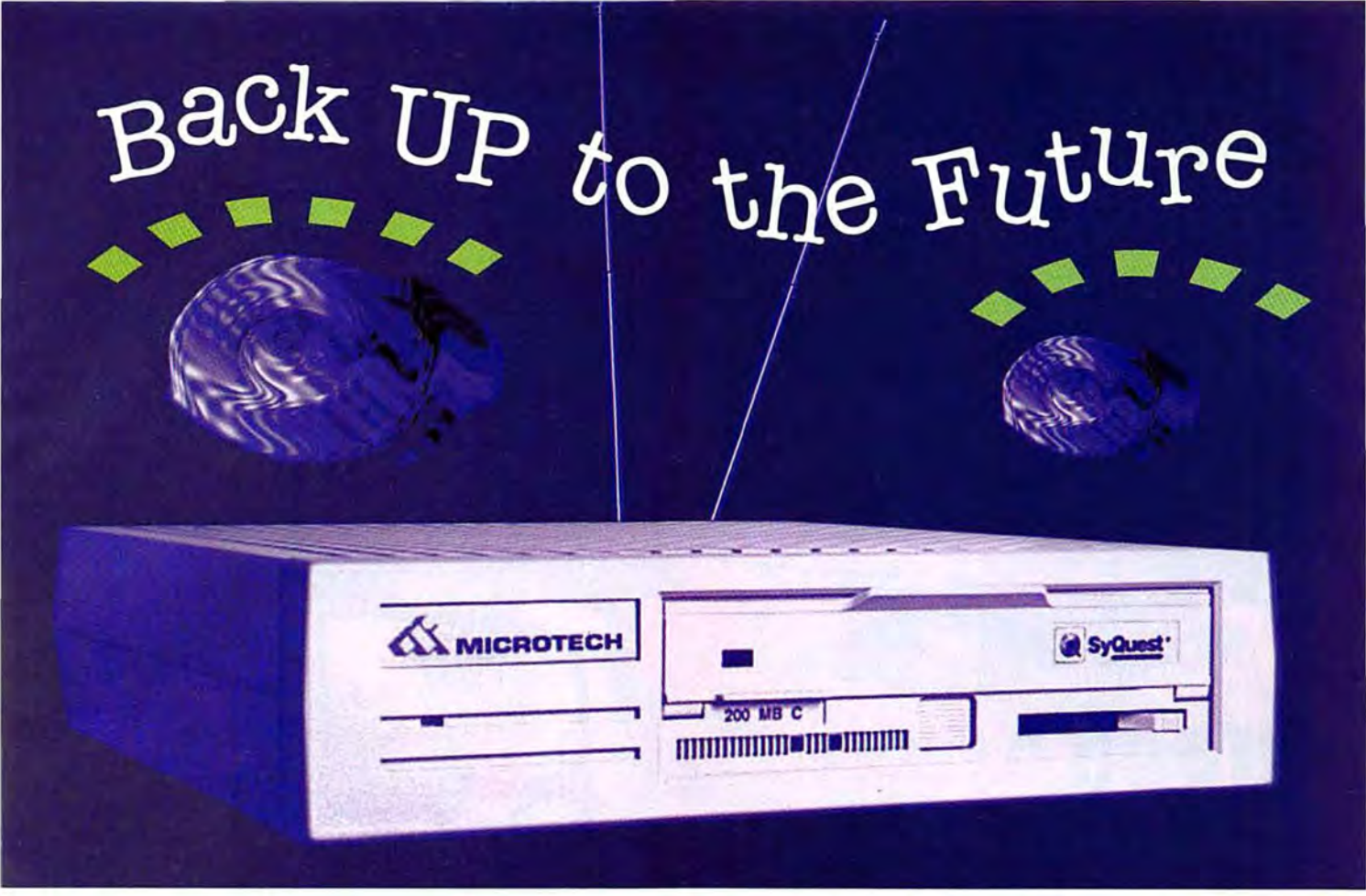
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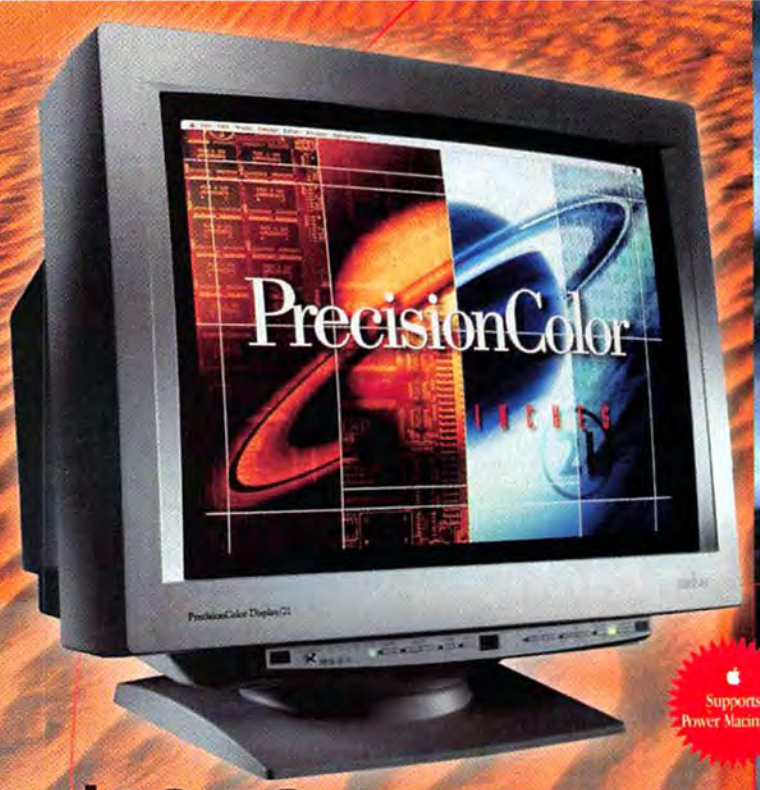
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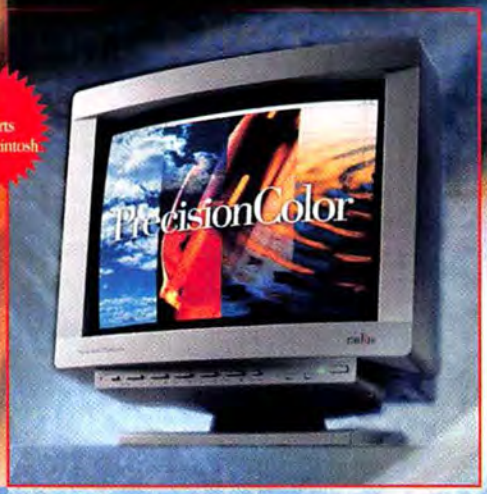
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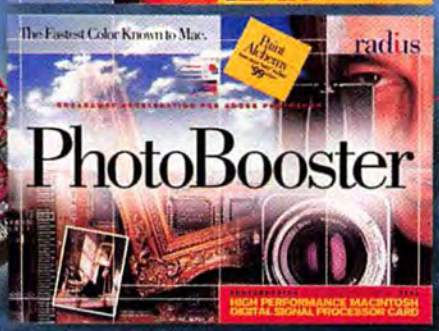
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RasterOps 20 inch Trinitron **$1699**
Radius PrecisionColor Display/17 **CALL!**
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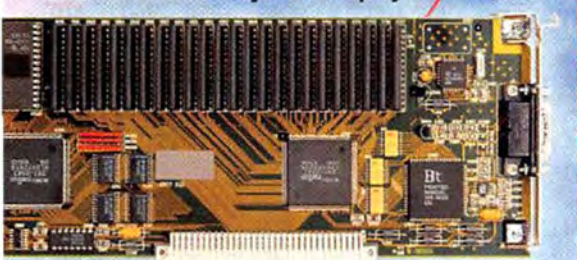
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Sony 17" Trinitron w/24-bit video card **$1198**
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APS MX 345[2] Maxtor 7345 mechanism	324MB	289	389
APS Q 340[2] Quantum 340 mechanism	327MB	279	379
APS *I*^{mr} 360[2] IBM DSAS 3360 mechanism	342MB	299	399
APS *I*^{mr} 540[2] IBM DSAS 3540 mechanism	522MB	399	499
APS Q 540[2] Quantum 540 mechanism	516MB	399	499
APS *I*^{mr} 720[2] IBM DSAS 3720 mechanism	700MB	499	599
APS MS 1.2AV[5] Micropolis 2210AV mechanism	965MB	759	859
APS MS 1.2[5] Micropolis 2210 mechanism	1001MB	699	799
APS *I*^{mr} 1.0[5] IBM 0662 mechanism	1003MB	699	799
APS MS 4110[5] Micropolis 4110 mechanism	1002MB	699	799
1029MB - 2845MB			
APS Q 1080[2] Quantum 1080S mechanism	1029MB	$749	$849
APS MS 1.7 AV[5] Micropolis 2217AV mechanism	1612MB	999	1099
APS MS 1.7[5] Micropolis 2217S mechanism	1682MB	929	1029
APS *I* 2.0[5] IBM 0664 mechanism	1920MB	1299	1399
APS ST 2.0[5] Seagate ST 12550N Barracuda mech.	2040MB	1549	1649
APS MS 2.4G[5] Micropolis 1924 mechanism	2100MB	1349	*1549
APS MS 3.0G[5] Micropolis 1936 mechanism	2845MB	1999	*2199
APS ST 4.0[5] Seagate ST 15150 mechanism	4294MB	2799	2899
APS ST 9.0[5] Seagate ST 410800N mechanism	8673MB	4149	*4349

Internal drives for Quadra 800 and Centris 610 available.
DATerm patent pending
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[1-5] *Denotes length of manufacturer's warranty*
* *External Case is Special Full Height Only*
* *Internal Price Listing*

POWERBOOK DRIVES

Model	Capacity	LW Pro 630	Internal	Companion II AC/DC
APS PB 85[1]	80MB	$249	—	
APS PB 170[1]	160MB	249	$199	$349
APS T 213[1]	202MB	319	269	419
APS PB 250[1]	240MB	349	309	459
APS T 340[1]	324MB	549	499	649
APS T 520[1]	500MB	649	599	749

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Model	Capacity*	Internal	SR 2000
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APS HyperDAT[1]	8-10G on 120m tape	1149	1199

*Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.

DAT Media (Units)	*1-4*	*5-19*	*20+*
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Model	SR 2000
APS T 4101	$299
APS T 3401	439

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APS 1.3Gig MO[1]	2399	2499

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SYQUEST

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APS SQ 5200[2]	200MB††	499
APS SQ 3105[1]	105MB	329
APS SQ 3270[1]	270MB	499

† Does not format 44MB cartridges
†† Does not format 44MB cartridges
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SyQuest Media	*1-4*	*5-19*	*20+*
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88MB cartridge —	*79*	*77*	*76*
200MB cartridge —	*89*	*87*	*86*
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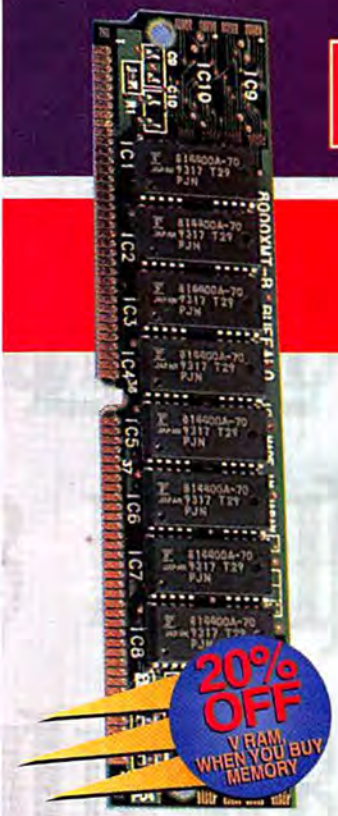
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2x8x80	$73	4x8x70 (II,IIx)	$157
2x8x70	$75	8x8x70 (IIfx)	$349
4x8x80	$135	16x8x70 (Low Profile)	$625
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POWERBOOK MEMORY

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PB160-180-4/6/8/10	$139 / $199 / $272 / $324
PB165C-180C-4/6/8/10	$155 / $232 / $319 / $405
DUO 210 - 280C 4/8/12	$172 / $315 / $535
DUO 210 - 280C 14/20/28	$595 /$932 / $1430
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553MB/63 Min.	$19
SONY 4mm DAT	
4MM 60M 1.3GB	$12
4MM 90M 2GB	$13.50
4MM 120M 4GB	$24
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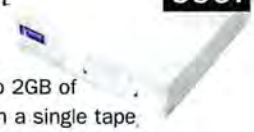
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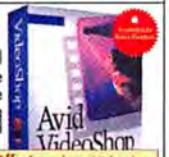
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Super fine pitch Trinitron tube with .30mm aperture grille, max. resolution 1280x1024, includes Sony Display Memory
Adapter required
$1949.99



Multiscan 15SF 15" MultiScan® Trinitron®
Energy Star and MPR II ELF/VLF compliance, Maximum resolution 1280x1024 (60Hz); sharp .25mm dot pitch; Color temperatures: 5,000k and 9,300k for greater color accuracy
Adapter required
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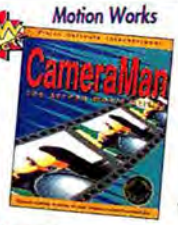
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Personal Computer Speakers SRS-PC50	$94.99	65682
Desktop Personal Computer Speakers		
SRS-PC20	$29.99	65786
AC Adapter for SRS- PC20	$17.99	65787
MacView Sony to Mac Adapter	$18.99	63667
Sony to Mac Adapter 640X480	$16.99	60426

Cameraman 2.0

MBG NEW Product

Motion Works



CameraMan 2.0 is the best version yet of the first and only screen recording utility available for the Macintosh. It is the tool of choice for educators, trainers, and software developers, among many others, who need an easy and inexpensive way to create application and system software tutorials, demonstrations and online help. A CameraMan movie is the most efficient way to show Macintosh users how to get the most from their software. Includes editing, sound recording capabilities and a royalty-free runtime player.

$89.99 65717

Multimedia Utilities..... $154.99 65718

Artifice, Inc.

Design Workshop



Design Workshop brings you a new paradigm in modeling with design-oriented three-dimensional direct manipulation. For the first time, the familiar click-and-drag MacDraw style interface has been extended into three dimensions–allowing designers to create intuitively in 3D, unencumbered by complex commands sequences or abstract projections. Objects are created, resized, moved and shaped graphically and it instantly transforms rough 2D positioning into exact 3D alignment.

$439.99

Design Workshop for 64k 64570
Design Workshop for Power PC 64570

90 Day Money Back Guarantee

....a breakthrough in 3D modeling for designers

3TI
BATTERY TECHNOLOGY, INC.

Slim Pack for Duo



Compatible with PowerBook 100 to 180c, with typical runtime of 7-9hrs on 100 to180, no memory effect. Uses Apple AC adapter to charge. Weighs only 2lbs.

$239.99 65527

Slim Pack for PowerBook.... $148.99 64536

High Capacity Battery for PowerBook	$58.99	60640
Power Gage Battery for PowerBook	$74.99	63551
PowerCharger Plus for PowerBook	$98.99	63550
RapidCharger for Duo	$99.99	64534
StarterKit for PowerBook	$124.99	61527
PowerKit for PowerBook	$159.99	65528
Mini AC Adapter for PowerBook	$59.99	65529
Mini AC Adapter for Duo	$59.99	65530
Newton X-Pack	$104.99	64535

SAMSUNG



SyncMaster 14GL $299.99 64990

SyncMaster 17GL $719.99 64989



SyncMaster 15GL $379.99 64991

SyncMaster 17GLS $849.99 64988

65556 **SyncMaster 4NE 15" Monitor** $349.99

All These Samsung Monitors Include a Free Mac Adapter

MacTrack Trackball

Microspeed



If you're tired of chasing your mouse around, the MacTrack Trackball is the answer. Features: Ergonomic design, easily adjustable resolution, control panel software for custom command key functions, uses less desk space than a mouse and does not require a pad or cleaning.

50589 $64.99

BEST BUY

Mouse Deluxe–Mac
Mouse Deluxe Mac is designed to provide one, two or three button input and high resolution 500 DPI tracking for all Macintosh models and applications.
65716 $44.99

Mac Keyboard Deluxe
Mac Keyboard Deluxe is a feature rich, value priced Apple, Macintosh and Power Mac compatible Extended 105 Keyboard, features four ADB ports
65715 $79.99

Magnavox



Magnavox 14" Color Monitor 61905
Fully compatible with most Apple Macintosh Models; 640x480 res; .29mm dot pitch
$269.99



Magnavox 15" Autoscan Color Display 65161 $389.99
28 mm dot pitch, high resolution analog, max resolution 1280x1024 non-interlaced

Phillips

Phillips 17" Trinitron Color Display $869.99 65162



Phillips 15" Color Monitor $469.99 64189



Portrait

Portrait 15 Pivot 65207 $799.99
Full color multi-frequency display for Macintosh and Windows. Optimized for displaying 256 colors at up to 1024x7768 resolutions, .28mm dot pitch.

MBG



Vivid Vision™ 17T Monitor $869.99 64907
17" Trinitron Color Display



New Hours: Mon.–Fri. 4am to 8pm (pst), Sat./Sun. 7am to 6pm (pst)
Effective Sept. 1st.– 7am to 11pm (est) 10am to 9pm (est)

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Hard Drives

Quantum



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Quantum's hard disk drives are available in 2.5 and 3.5-inch form factors in storage capacities ranging from 170megabytes to 2.1 gigabytes.

LPS 270MB INTERNAL



- Fast SCSI-2
- 4,500 RPM
- 10ms access time
- WriteCache & DisCache Firmware

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Includes all necessary brackets and software

GO•DRIVE SERIES
2.5" POWERBOOK DRIVES

Capacity	Access	Internal	External
170mb	17ms	$259	$379
256mb	17ms	$339	$459

LPS SERIES
3.5" LOW PROFILE

170mb	14ms	$189	$249
270mb	11ms	$239	$299
340mb	11ms	$279	$339
540mb	10ms	$369	$429

EMPIRE SERIES
3.5" HIGH PERFORMANCE

1080mb	9.5ms	$739	$799
1400mb	9.5ms	$909	$969
2100mb	9.5ms	$1239	$1299

Quantum Pro and Empire series carry a TWO Year Warranty
Go-Drives carry a ONE Year Warranty

Seagate



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Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
3.5" HALF HEIGHT						
1.7GB	ST11900N	Hawk 2	9ms	1600mb	$1199	$1259
2.1GB	ST12400N	Hawk 2	9ms	2000mb	$1549	$1609
4.3GB	ST15230N	Hawk 4	9ms	4000mb	$2139	$2199
1.7GB	ST11950N	Barracuda 1	8ms	1350mb	$1469	$1529
2.1GB	ST12550N	Barracuda 2	8ms	2050mb	$1519	$1579
4.3GB	ST115150N	Barracuda 4	8.5ms	4000mb	$2489	$2549
5.25" FULL HEIGHT						
2.9GB	ST43400N	Elite-3	11ms	2750mb	$2089	$2189
9.1GB	ST410800N	Elite-9	11ms	8600mb	$3739	$3839

Seagate drives carry a ONE Year Warranty

CD-ROMs

NEC

NEC MultiSpin 3Xp

The 3Xp combines 3X transfer rate performance, 250ms access time and a 256 KB continuous-flow cache in a compact design, making it and incredible value. At only 2.4 lbs the 3Xp is the world's lightest triple speed CD-ROM reader.



MultiSpin CD-ROM Reader | MPC2 Multimedia PC | Photo CD

MultiSpin 3Xp CD-ROM Reader

CD-ROM READERS

	w/o bundle	w/ClubMac CD bundle
MultiSpin 3Xp (Portable, 250ms access time, very light; 2.4 lbs)	$399	$499
MultiSpin 3Xi (Internal, 195ms access time, 450KB/sec data transfer)	$439	$539
MultiSpin 3Xe (External, 195ms access time, 450KB/sec data transfer)	$469	$569
MultiSpin 4X Pro (External, 180ms access time, 600KB/sec data transfer)	$929	$1029

NEC MultiSpin CD-ROM Readers carry a TWO Year Warranty

ClubMac Removable Drives



FEATURING SyQuest REMOVABLE TECHNOLOGY

ClubMac 30 DAY MONEY BACK GUARANTEE



CLUBMAC 3.5" REMOVABLES

CLUBMAC 5.25" REMOVABLES

CLUBMAC REMOVABLES

	Internal	External
ClubMac 44mb 5.25" (SQ555)	$199	$229
ClubMac 88c 5.25" (SQ5110C)	$379	$419
ClubMac 200mb 5.25" (SQ5200)	$529	$569
ClubMac 105mb 3.5" (SQ3105)	$289	$329
ClubMac 270mb 3.5" (SQ3270)	$499	$539

CARTRIDGES

44mb (SQ400)	$59
88mb (SQ800)	$69
200mb (SQ2000)	$79
105mb (SQ310)	$59
270mb (SQ327)	$65

All SyQuest drives include a TWO Year Warranty.
All drives include SCSI Director formatting software, ONE FREE Cartridge, necessary cables for "plug-and-play" and documentation.
All SyQuest cartridges include a FIVE Year Warranty.

ClubMac Optical Drives

ClubMac 30 DAY MONEY BACK GUARANTEE



CLUBMAC 5.25" 650MB SHARP OPTICAL

ASK ABOUT OUR NEW 1.3GB SHARP OPTICAL

			Access Time	Internal	External
ClubMac (M2512A) 3.5" 230mb Fujitsu Optical			30ms	$899	$929
ClubMac (JY-750) 5.25" 650mb Sharp Optical	MW		40ms	$1669	$1699
ClubMac (JY-800) 5.25" 1.3GB Sharp Optical		NEW	40ms	$2069	$2099
Fujitsu (M2512A-DYNAMO) 3.5" 230mb Dynamo			30ms		$929
MaxOptix Tahiti III (9400) 5.25" 1.3GB Optical			19ms		$2499
Hewlett-Packard (C1716T) 5.25" 1.3GB Optical External			28ms		$2399

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

ClubMac Tape Backups

ClubMac 30 DAY MONEY BACK GUARANTEE



Capacity	Model	Format	Media	Internal	External
2.0GB	ClubMac DAT	DDS	60m, 90m	$739	$789
2-4GB	ClubMac DAT/DC	DDS-DC	60m, 90m	$929	$979
4-8GB	ClubMac DAT/2	DDS-2	60m, 90m, 120m	$1139	$1189
2.0GB	HP DAT	DDS	60m, 90m	$939	$989
2-4GB	HP DAT/DC	DDS-DC	60m, 90m	$1049	$1099
4-8GB	HP DAT/2	DDS-2	60m, 90m, 120m	$1319	$1369
2-4GB	EXB-8205S	8mm	112m	$1499	$1549
5-10GB	EXB-8505S	8mm	112m	$2315	$2365

ClubMac DAT and DAT/DC drives include Retrospect v2.1 Backup Software, ONE 90 Meter Tape and a TWO Year Warranty. HP DAT drives carry a ONE Year Warranty
The ClubMac DAT/2 & HP DAT/2 drive includes Retrospect Remote v2.0 (3-Pack) Network Backup Software, ONE 120 Meter Tape and a ONE Year Warranty

ClubMac CD-ROM Reader



ClubMac 2X Speed CD-ROM Reader

- 320ms access time • Caddy-Less design
- Double Speed performance
- Headphone jack and RCA jacks
- PhotoCD compliant • No Caddy Needed

$199

ClubMac 30 DAY MONEY BACK GUARANTEE

		w/o bundle	w/ClubMac CD bundle
ClubMac Dual-Speed (External, 320ms access time)		$199	$299
ClubMac Quad-Speed (External, 150ms access time)	NEW	$599	$699

The ClubMac CD-ROM readers carry a ONE Year Warranty

ClubMac CD-ROM Bundle

$800 VALUE



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Monitors, Graphic & Video Cards

radius

GRAPHIC CARDS

LeMansGT (0447)	$1835
PrecisionColor Pro 24X (0429)	$1319
PrecisionColor Pro 24XK (0430)	$729
PrecisionColor Pro 24XP (0431)	$439
PrecisionColor 24X (0421)	$879
PrecisionColor 8XJ (0369)	$439

MULTIMEDIA

VideoVision Studio (0418)	$3295
VideoVision Studio Upgrade (0419)	$1499
VideoVision Studio Basic (0416)	$1509

MONITORS

PrecisionColor Display/21 (0463)	$1969
IntelliColor Display/20e (0461)	$1949
PrecisionColor Display/20v (0427)	$1379
PrecisionColor Display/17 (0460)	$959*
Pivot Display (0361)	$549
Full Page Display/gs (0424)	$479
TPD20gs (0436)/21gs (0437)	$785/$969

* After MFR $100.00 rebate. Offer expires 09/30/94

IntelliColor Display/20e

NEW



The NEW Radius IntelliColor Display/20e is part of the next generation in professional two-page color displays. It delivers unrivaled command of your desktop, from on-the-fly resolution switching to state-of-the-art color temperature control.

$1949

PrecisionColor Display/17



- 17" Color Monitor
- Resolutions up to 1152 x 870 built-in Video Support for two-page layout work
- Radius PowerSaver
- DOS & Windows compatible
- 0.26mm Aperture Grille Pitch
- MPR II compliant

$959*

Flawless graphics performance at the right price. Now get additional $100 savings. Get a $100 Rebate from RADIUS

NEC

Back-to-School Special!



$429**

15" MultiSync 3V

MONITORS

14" MultiSync 2V (JC-1432VMA) up to 832 x 624	$315†
15" MultiSync 3V (JC-1535VMA) up to 1024 x 768	$429**
15" MultiSync 4FGe (JC-1531VMA-3) up to 1024 x 768	$629
17" MultiSync 5FGe (JC-1731VMA-3) up to 1024 x 768	$989
17" MultiSync 5FGp (JC-1741UMA-3) up to 1280 x 1024	$1099
21" MultiSync 6FGp (JC-2141UMA-3) up to 1280 x 1024	$1999

NEC Monitors carry a THREE Year Warranty.
†After MFR $25.00 rebate. ** After MFR $40.00 rebate. Offers end 09/30/94

PRINTERS

Silentwriter 640 6ppm, 300 dpi, 52 fonts, PS Level 2	$679*
Silentwriter 1097 10ppm, 600 dpi, 35 fonts PS Level 2	$1379

The Silentwriter 640 carries a Limited TWO-Year Overnight Replacement Warranty
The Silentwriter 1097 carries a ONE Year Warranty.
*After MFR $50.00 rebate. Offer ends 09/30/94

Printers

NEW at CLUBMAC

HP DeskJet 1200C/PS PostScript Printer



$2215

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HP DeskWriter Inkjet Printers carry a THREE Year Warranty.
HP DeskWriter 310 Printers carry a ONE Year Warranty.
HP LaserJet Printers carry a ONE Year Warranty.

HP DeskWriter 310 Printer 300 x 300 dpi, 3ppm, Optional Color Kit Available	$309
HP DeskWriter 310 Printer with Cutsheet Feeder (60-sheet),Color Kit Available	$369
HP DeskWriter 520 Inkjet Printer 600 x 300 dpi, 3ppm, 35 fonts	$289
HP DeskWriter 560C Inkjet Printer 600 x 300 dpi color, 3ppm, 35 fonts	$575
HP DeskJet 1200C/PS PostScript Printer 600 x 300 dpi, 6ppm	$2215
HP LaserJet 4ML Printer 300 x 300 dpi, 4ppm, 35 scalable fonts	$1029
HP LaserJet 4MP Printer 600 x 600 dpi, 4ppm, 35 scalable fonts	$1395

Acceleration

3 Year Warranty

DAYSTAR DIGITAL

TURBO 040 ACCELERATORS

Turbo 040 (with FPU support)

33 MHz Turbo 040 w/128K cache (000773)	$789
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FastCache Turbo (000223)	$165

APPLICATION ACCELERATORS

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Quad 040 w/128K cache (Quadra/Centris) (000056)	$955

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66 MHz PowerPro 601 (000728)	$1497
80 MHz PowerPro 601 (000735)	$1997
FastCache PowerPro-1MB Cache (000742)	$499

POWERCACHE

	without FPU / with FPU
33 MHz PowerCache (P31UV-033)	$275 / $357
50 MHz PowerCache (P31UV-050)	$415 / $537
PowerCache Adapter*	$99

* Not req'd for IIci, IIvi, IIvx, Performa 600

Networking

10THUB/12	10BT Hub w/12 10T, Thk & Thn ports	$465
10THUB/8	10BT Hub w/8 10T, Thn port	$229
Mini EN/SC	Thn/10BT SCSI Ether w/DT& PB cable	$297
Mini EN/SC10T	10T SCSI Ethernet w/DT & PB cable	$237
NETEXT-FN	AAUI Hub w/4 RJ45 ports	$179

ASANTÉ

FNTNA	10BT or Thin FriendlyNet Media Adapter	$65
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MAC+IIET64	Mac II & Perf 600, Thk, 10BT, 64K	$139
MC3NB	Mac II & Perf 600, Thk/Thn/10BT, 64K	$189
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Great for graphic artists who want top-quality images and multiple resolutions. The SuperMac 20•T XL features 9 preset and 16 definable display modes, resolutions up to 1152 x 870 and digital controls.



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Thunder II GX•1152's 1152 x 870 resolution is great for viewing a full two-page spread without scrolling. A cost-effective solution with all the power of CMYK acceleration, image-processing acceleration, image-processing acceleration, and QuickDraw acceleration. It is also Power Macintosh compatible.

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Spectrum/24 Series V (G3930)	$829

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SuperMatch 17XL (STD1701)	$999
Platinum 21 Two-Page GS (STD9761)	$999
PressView 21 Display System	$3199

MULTIMEDIA SOLUTIONS

DigitalFilm Deluxe (DV2050)	$1699
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Video Spigot NuBus LC (DV1050)	$235

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Better Images Through Innovation.

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ScanMaker IIHR with full version of Photoshop	$1079

EPSON 2 YEAR WARRANTY **ES-1200C Pro Mac**

NEW



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- Optical resolution: 600 x 1200 dpi
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- 30-bit internal, 24-bit external
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Input Devices

WACOM UD Graphic Tablet



WACOM PRODUCTS

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UD 12x18 Standard Tablet	$959
UD 18x25 Standard Tablet	$2579

ClubMac Extended Keyboard

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Available in the following versions:
- English • Swiss
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Includes a ONE Year Warranty

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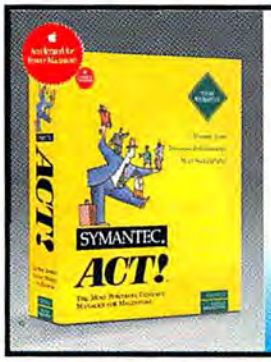
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Publisher: Symantec

Full version of ACT! for Macintosh 1.1
Ask for Item# BUS 0316 $169.95

NEW!

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$79.95

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NEW!

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The best-selling, highest rated virus protection, detection and repair program is now EVEN BETTER! SAM (Symantec AntiVirus for Macintosh) is the worldwide standard in Mac virus protection. Key features: Virus detection & repair, proactive prevention, automatic virus updates, faster scans, custom decontamination disk and much more! Proof of ownership required. Call for details. *Publisher:* Symantec

Full version of SAM 4.0: UTI 0567 $69.95

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New Wild & Wacky Modules!

After Dark 3.0 Upgrade

NEW!

Protect your monitor with After Dark 3.0's 30+ dazzling screen-saving displays. Watch NEW modules like Bad Dog trashing your desktop, test your trivia knowledge in You Bet Your Head or bet at the track with Rat Race. Swim with new Fish or soar with Flying Toasters with Karaoke!



Publisher: Berkeley Systems

**Upgrade price reflects $10 REBATE from manufacturer. Price without rebate is $29.95. Call for details.*

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$19.95*

Think of it as a camera for your mind

Adobe Photoshop 3.0 Upgrade

NEW!

Get even more creative and production control than ever! The improved interface and palette design gives you even better access to your tools. New layers support make image compositing easy. Add multiple layers to your image to try out different combinations of placements and graphics, text and special effects without altering the original background image and more.



Publisher: Adobe

Full version of Photoshop 3.0
GRA 0814 $559

Item# UPG 0103
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Retrospect Remote 2.1



Powerful Mac network backup software for centralized backup and archiving. Create scripts with multiple sources, destinations, and file-selection criteria with ease. Then schedule the scripts so your backups run automatically on any day and at any time. Supports compression, encryption and verification.

Publisher: Dantz Development

Item# UTI 0196
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SyQuest® Blowout!

Featuring SyQuest

Now you can order a 44MB Removable SyQuest Drive for an incredible low price! Power User SyQuest drives provide you with unlimited hard disk storage-without imprisoning your data on a hard disk! Whenever you run out of storage space, simply eject the cartridge you've just filled up, and insert an empty one. It's that simple! Order the capacity you need, and the storage potential you deserve.

44MB SyQuest without cartridge
Ask for item# DRI 0977

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PLUS Get your first* 44MB cartridge for only **$29.95** when you buy the 44MB drive at the same time.
(Total price $228.95)
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**Limit one 44MB cartridge for each 44MB drive purchased. Call for details.*

The most affordable, full-function keyboard ever!

The Power User105 Extended Keyboard

Work faster and easier with 105 keys, logically arranged for quick typing, cursor movement, and number calculations. The Power User 105 Extended Keyboard also features an ergonomic design.

Item# INP 0336
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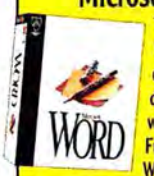
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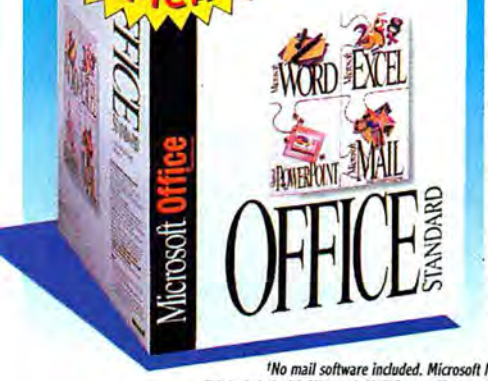
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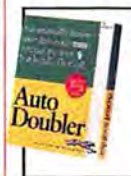
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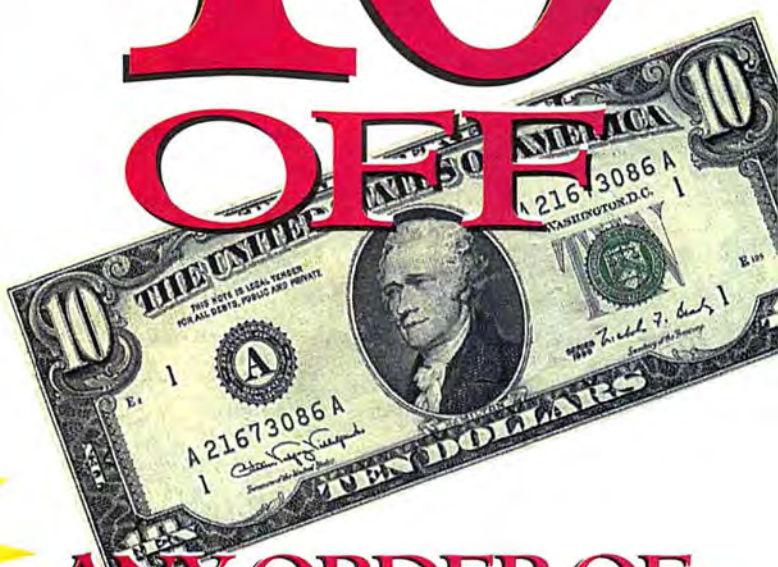
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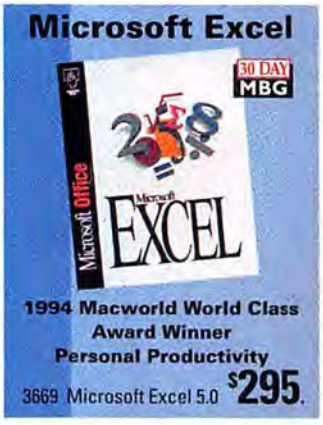
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12093 **MacLinkPlus/TransPro** 95.
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1. For how many micro computers do you buy products? (check one)
☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

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☐ 01) Administrative/ General Management
☐ 02) MIS/DP, Communications
☐ 03) Engineering/R&D
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☐ 05) Marketing/Sales
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Systems, Programming

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE:	Q3	Q4
Accounting	☐ 01	☐ 01
Spreadsheets/Financial Planners	☐ 02	☐ 02
Project Managers/Planners	☐ 03	☐ 03
Word Processors	☐ 04	☐ 04
Database Managers	☐ 05	☐ 05
Graphics/Presentation Software	☐ 06	☐ 06
Integrated Software	☐ 07	☐ 07
Communications	☐ 08	☐ 08
Utilities	☐ 09	☐ 09

HARDWARE:	Q3	Q4
Modems	☐ 10	☐ 10
Scanners	☐ 11	☐ 11
Microcomputers	☐ 12	☐ 12
Printers/Plotters	☐ 13	☐ 13
Monitors/Displays	☐ 14	☐ 14
Storage	☐ 15	☐ 15
Add-in Boards	☐ 16	☐ 16
Networking	☐ 17	☐ 17

5. If so, what function do you serve in the buying process? (check all that apply)
☐ 01) Initiation/ Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)
☐ 01) over $5 million
☐ 02) $1 - 5 million
☐ 03) $500,000 - $999,999
☐ 04) $100,000 - $499,999
☐ 05) $50,000 - $99,999
☐ 06) $10,000 - $49,999
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Printers/Plotters	☐ 13	☐ 13
Monitors/Displays	☐ 14	☐ 14
Storage	☐ 15	☐ 15
Add-in Boards	☐ 16	☐ 16
Networking	☐ 17	☐ 17

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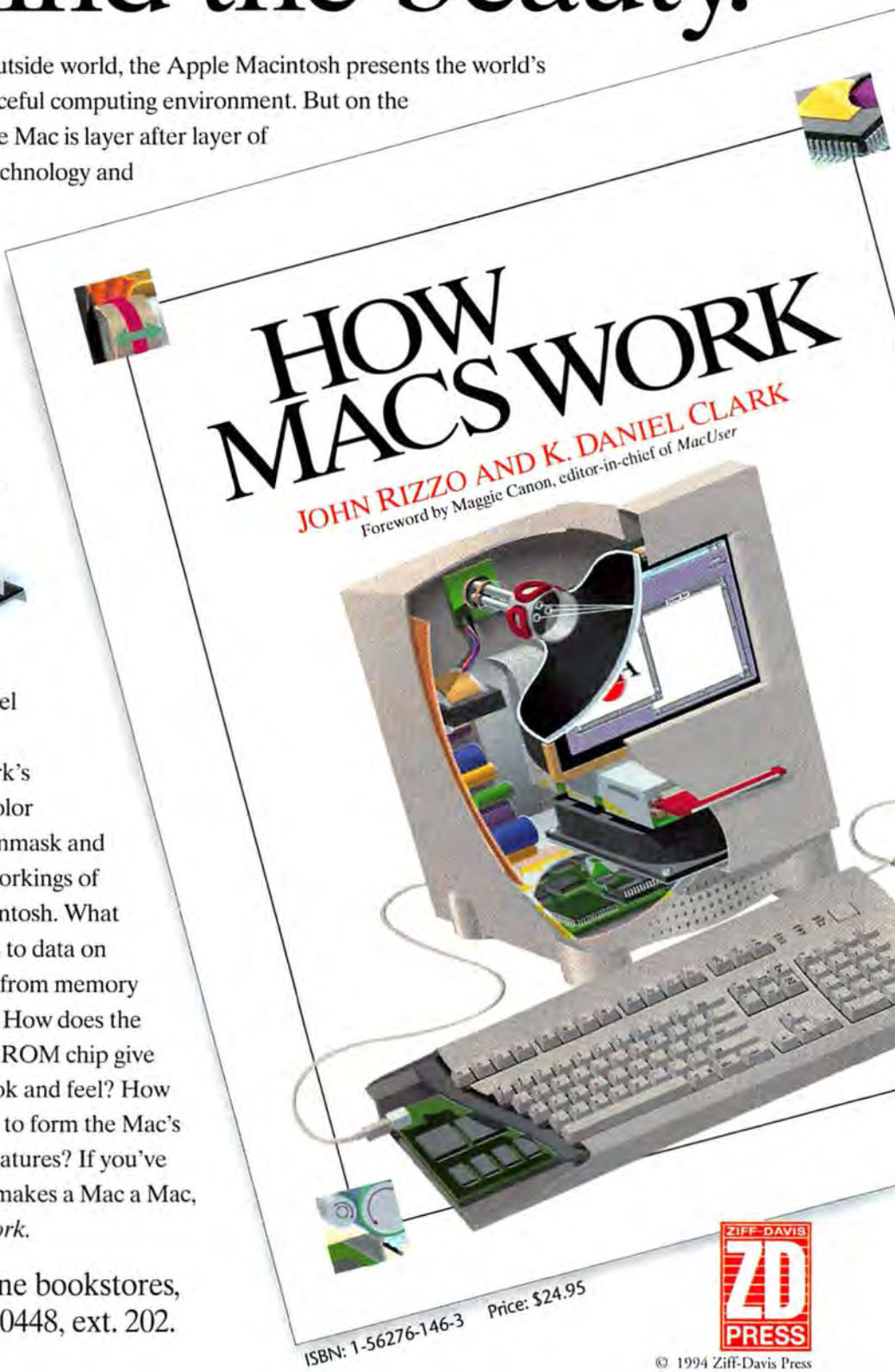
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210-211

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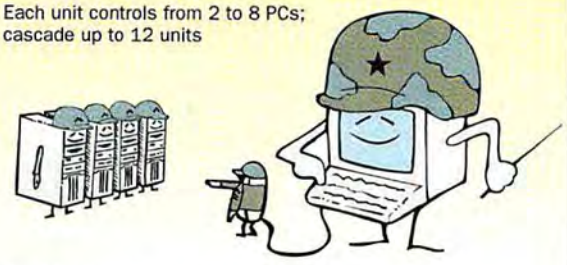
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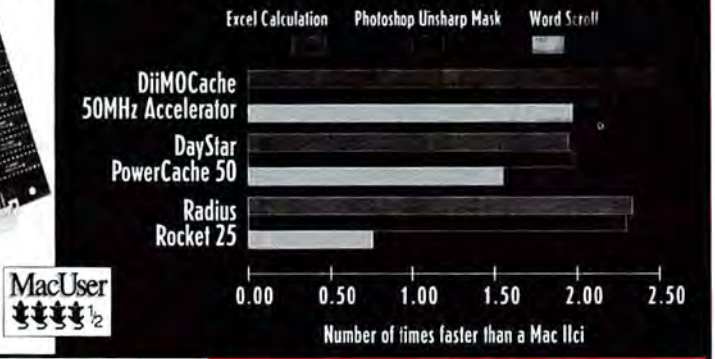
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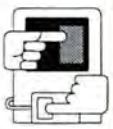
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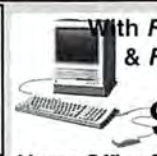
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MA-340 E	**340MB**	Quantum	11ms	**$349**
MA-540 E	**540MB**	Quantum	10ms	**$449**
MA-1080 E	**1080MB**	Quantum	9.5ms	**$789**
MA-1440 E	**1440MB**	Quantum	10ms	**$1289**

External Hard Drives include SCSI cable, A/C power cord, external terminator, FWB Hard Disk Toolkit and come preformatted and loaded with Apple's System 7.1 software.

INTERNAL HARD DRIVES

P/N	Capacity	MFR.	Access	
MA-170 I	**170MB**	Quantum	14ms	**$189**
MA-270 I	**270MB**	Quantum	11ms	**$239**
MA-340 I	**340MB**	Quantum	11ms	**$289**
MA-540 I	**540MB**	Quantum	10ms	**$389**
MA-1080 I	**1080MB**	Quantum	9.5ms	**$729**
MA-1440 I	**1440MB**	Quantum	10ms	**$899**
MA-2100 I	**2100MB**	Quantum	10ms	**$1229**

Includes: Bracket, SCSI cable, power cable, FWB Hard Disk Toolkit and comes preloaded with Apple's System 7.1 software.

POWERBOOK INTERNAL DRIVES



P/N	Capacity	
MA-170 P	160MB	**$255**
MA-213 P	202MB	**$312**
MA-256 P	250MB	**$319**
MA-340 P	324MB	**$499**
MA-520 P	500MB	**$649**

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MA-200	**200MB**	5.25"	**$559**	**$589**
MA-105	**105MB**	3.5"	–	**$349**
MA-270	**270MB**	3.5"	–	**$469**

External Removable Hard Drives include Hard Disk Cartridge, SCSI, cable, A/C power cord, external terminator, FWB Hard Disk Toolkit and come preformatted and loaded with Apple's System 7.1 software.

Internal Removable Hard Drives Includes: Hard Disk Cartridge, Bracket, SCSI cable, power cable, FWB Hard Disk Toolkit and comes preloaded with Apple's System 7.1 software.

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Quad/Cent 610/PwrMac 6100	**$19**	**$19**	**$45**
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Quadra 900/950	**$29**	**$29**	**$45**
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*HD mounting kits includes all brackets, SCSI & A/C power cables and mounting screws needed for complete installation. * Includes Face Plate for removable media drive installations.*

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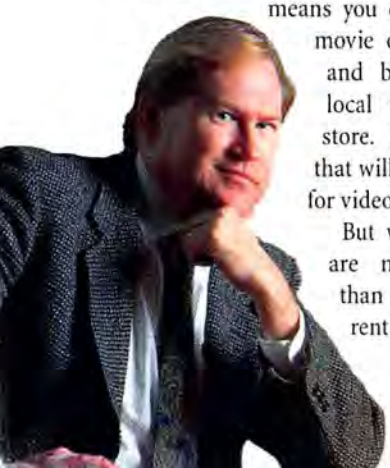
Home Phoneys

YOU CAN NEVER GO home again, at least not if you want to make money. I don't know why computer companies, software companies, phone companies, and investors are going gaga over proposed in-the-home entertainment services and the integration of TV and the computer. They're all nuts.

Let's start with the idea of downloading home games to the family TV via an expensive, set-top box. This runs counter to the true long-term gaming trend: complex games played on a computer, not on a cheap game machine hooked to a TV set.

But beyond that, downloading games to a set-top box is obviously the idea of loopy individuals who don't have children. No normal family is going to let the kids hog the main TV set so they can play yet another version of Super Mario. Most people have already set up a games "workstation" for the children someplace out of earshot in a far corner of the house where the kids can play games until they are bored stiff. And does anyone really think the adults are going to splurge for an expensive set-top box for the kids' TV while the main TV languishes without one? No way. We'll skip the expensive, set-top box altogether.

How about video on demand? Isn't that one of the hoped-for killer apps in this futuristic set-top-box world? Video on demand means you can order a movie on the spot and bypass your local video-rental store. Supposedly, that will spell doom for video stores.



But video stores are much more than places to rent videos — they're social centers. People look at tape boxes. They talk to each other. They ask the owner about current movies. They get out of the house. The video store is just another excuse for social interaction.

You see, most people can stand only so much sitting at home. With telecommuting taking people out of the office, day-to-day social interaction is already being reduced. This reduction is compensated for by places such as video stores.

(I don't know about you, but I've never even used the video-on-demand feature already available in most Class A hotels. I'd rather surf the channels or go outside and roam the town. Who uses this service? Duds. Who'll use the service at home? Duds. Some market, eh?)

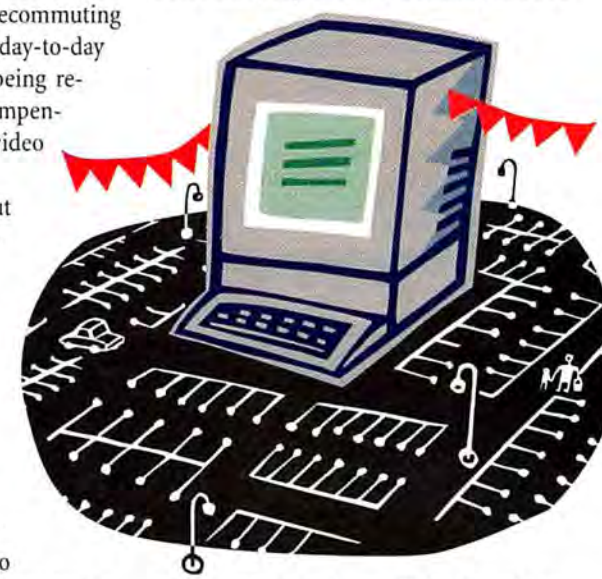
Computers and TV already cause people to stay home too much. Now the boneheads who are designing set-top boxes and hoping people will bite into video-on-demand schemes are trying to entice people to stay home even more. Can you spell *shut-in?*

Social Studies

There's nothing efficient about commuting an hour to work, attending useless meetings all day, and then driving home in gridlock. Studies show that telecommuters consistently outproduce their office counterparts. So why doesn't every company encourage employees to telecommute? The big argument against working at home is that you don't get to socialize as much as you should "for the team" and all that.

Now I ask you, how does this jibe with the idea of creating a home-shopping environment in which people can order groceries, movies, games, clothes, washing machines, and everything else by using the computer or the TV? Talk about minimizing socialization! This dream world of the multimedia mavens and set-top-box promoters is incredibly arrogant, don't you think?

I hate to point out the obvious to the promoters of these stupid schemes, but I'll do it anyway. People *like* to shop — preferably with other people. If there's nobody else in a store, customers leave. This doesn't say much for the future of on-line shopping, does it?

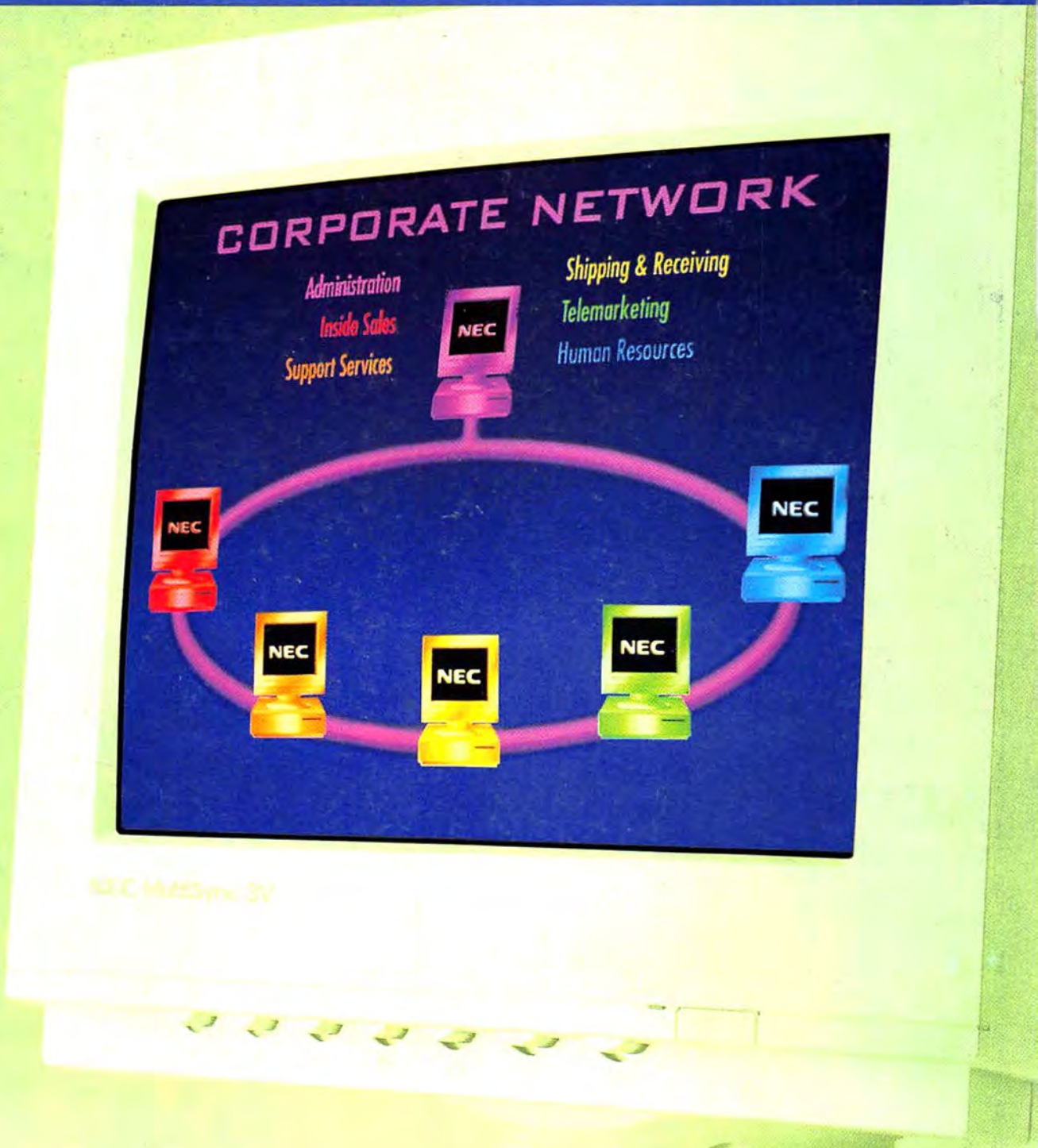


Remember: Computers are tools that are supposed to make us more efficient. Why do we want to be more efficient? So we can get out and have more fun! Or even so that we can watch TV (plain old-fashioned, preprogrammed TV). It's too easy to be swayed into thinking all this high technology is an end in itself. Gee, with the computer, I can do everything from my desktop. Oh golly, with the new cable-TV box, I can do everything the computer can do and I can do it from my couch.

You have to ask yourself: Yeah, but who wants to?

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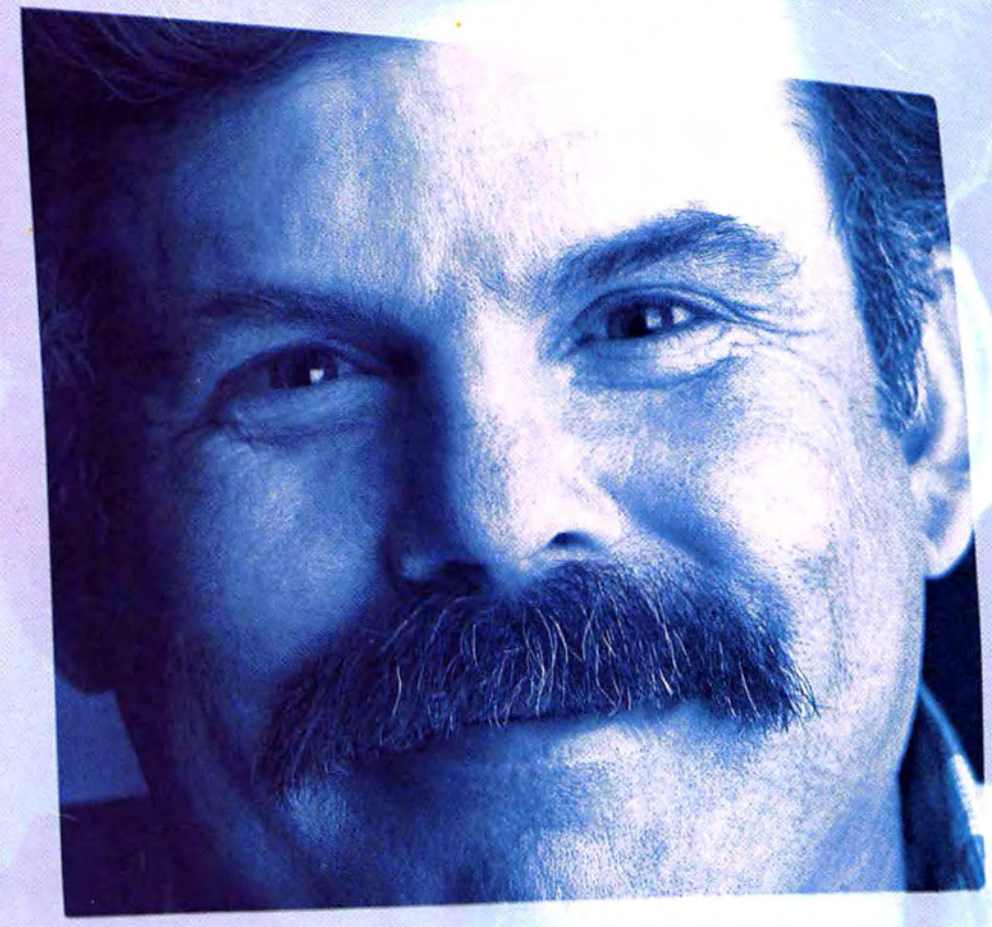
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